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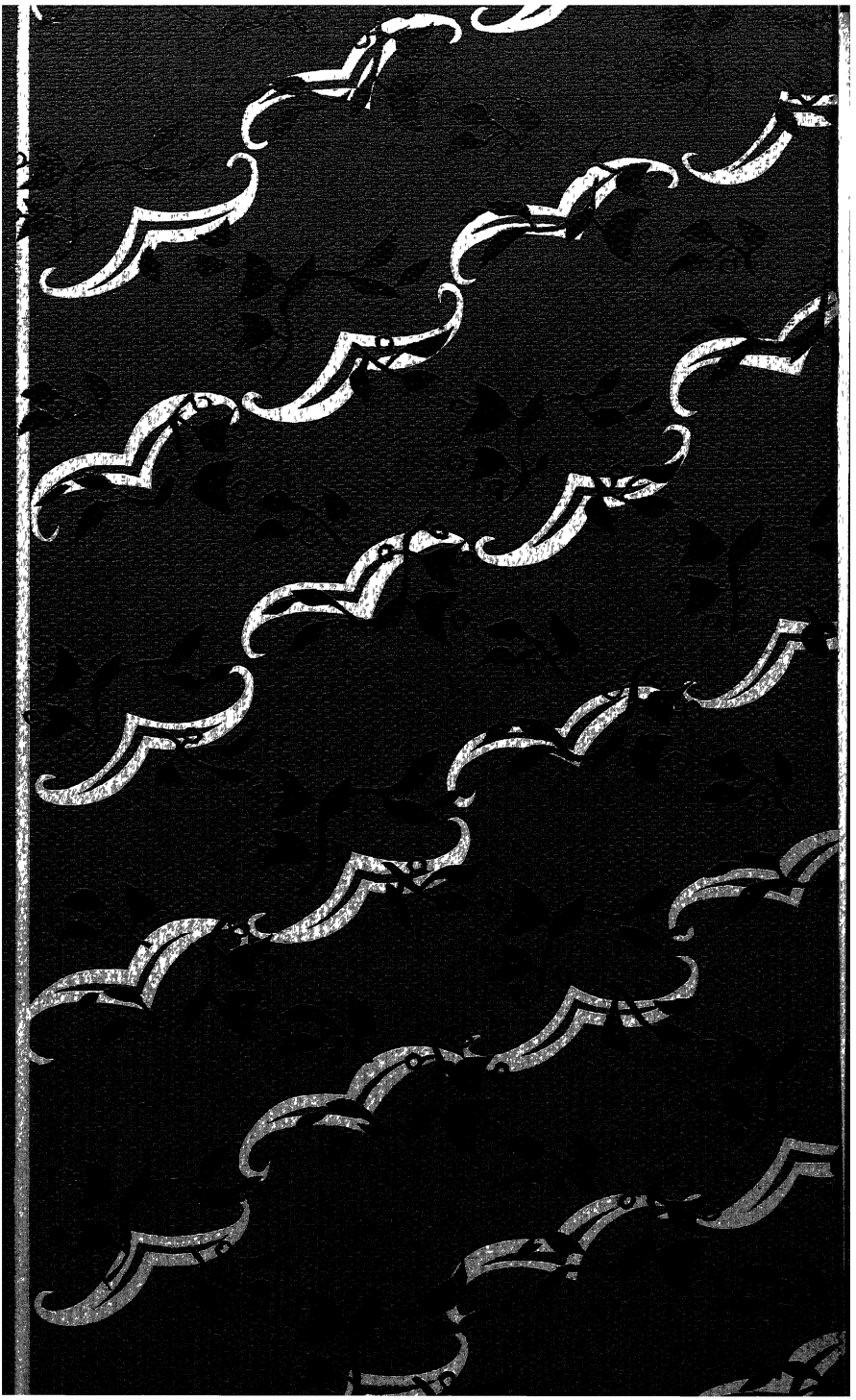

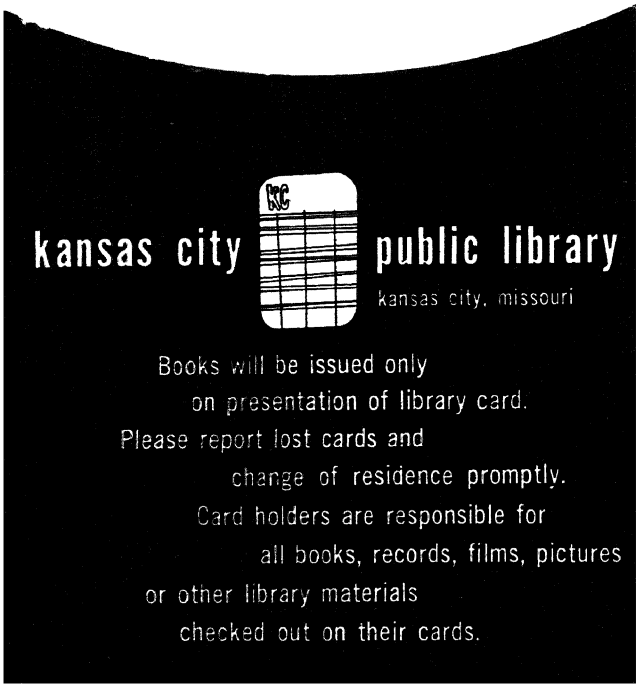

32

METAL SPINNING DESIGNS

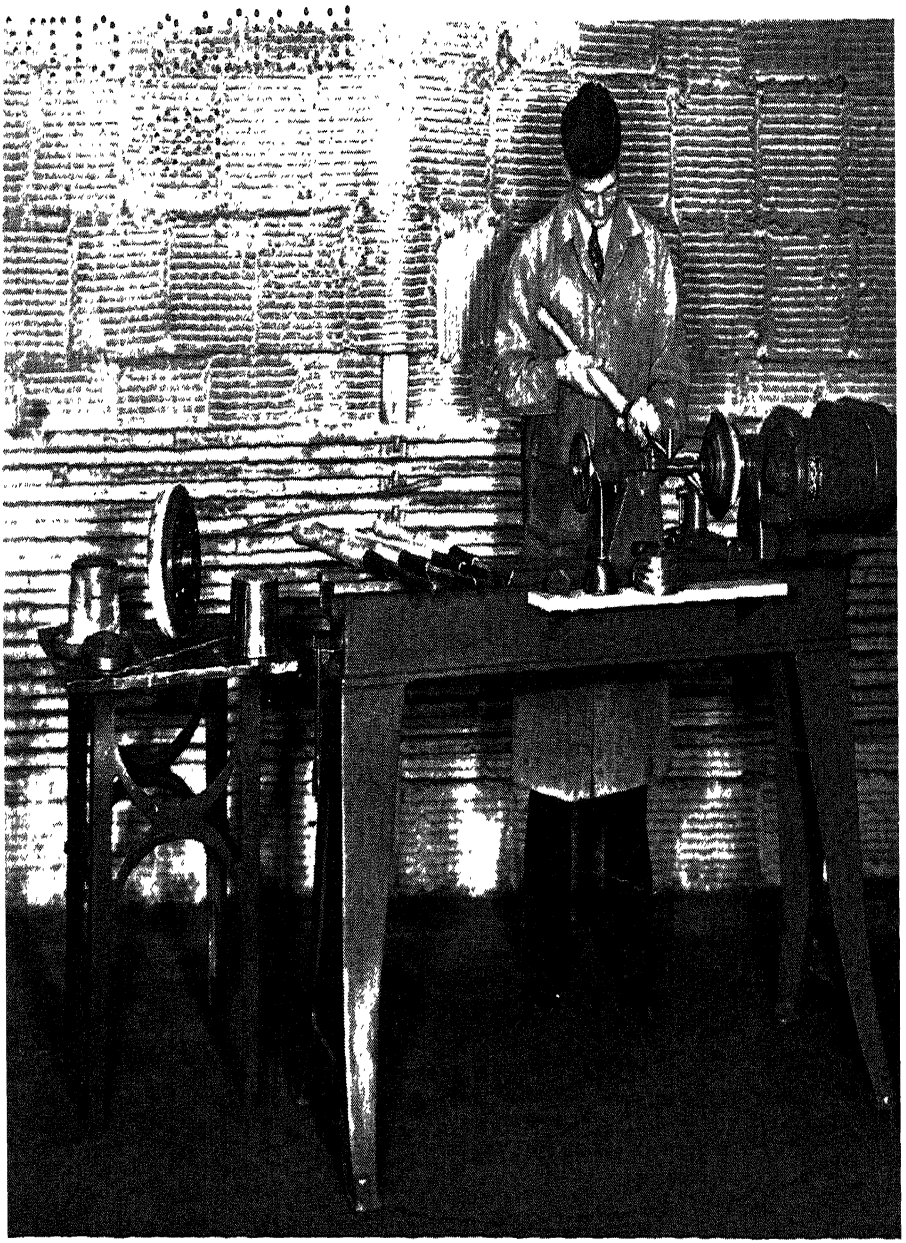

Fig. 1. Spinning

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METAL SPINNING DESIGNS

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THE BRUCE PUBLISHING COMPANY
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To my Father, Mother, and Wife

CONTENTS

PROJECTS

PREFACE

This book has been written for the purpose of assisting the teacher of industrial arts and also the homecraftsmen in acquiring the art of spinning metal. The author has endeavored to make the instructions as simple as possible and, therefore, has omitted some of the more complicated processes.

Any teacher or craftsman who is familiar with the use of woodworking tools, can spin metal into a variety of beautiful projects.

All of the articles have a detailed, step-by-step description so that the student will be able to spin them with very little aid.

Metal spinning has proved to be a fascinating addition to many industrial-arts courses. The teacher will find little trouble in getting student interest.

If the school shop is equipped with either wood or metal lathes, the cost of establishing a course in metal spinning is nominal. Most of the spinning tools can be made in the school shop.

A few of the metal spinning projects in this book are constructed from a combination of metal, plastics, and wood. This feature appeals to a great many shop teachers as it gives the student an opportunity to work with a variety of materials.

The author wishes to thank the following firms for their courtesy in supplying photographs. The Oliver Machinery Co. (Spinning, Fig. 1, and Metal Spinning Lathe and Tools, Fig. 2), and The Walker-Turner Co. (Spinning Center, Fig. 9, and Spinning a Bead, Fig. 20A).

HAROLD V. JOHNSON

CHAPTER I

ORIGIN OF METAL SPINNING

Metal spinning is the art of raising sheet metal disks into contoured forms by turning on a lathe. A tool pressed into a soft piece of metal makes a dent. If the tool is held against this dent and the metal is rotated about a center, the dent will turn into a groove, extending entirely around the object. It may then be said to have been "spun" into a changed form.

To secure this result, however, it is necessary that the metal in bending, shall meet a resistance in the form of a mold around which it can take shape. This shape, which is called the chuck, is usually made of wood. A knowledge of wood turning is of great help to the prospective metal spinner.

The Chinese originated metal spinning somewhere about the beginning of the tenth century of the Christian era. However, our present-day knowledge of the metal spinning craft has come from the Greeks and the Romans, who spun many of their household utensils from pewter.

During the reign of King Edward III metal spinning was introduced into England as a trade. Metal spinners formed their own guild systems to protect the craft against inferior workmanship.

About 1840 metal spinning was introduced into the United States, and before long there were many small shops that were turning out articles made from pewter and sterling silver. At the present time there are many big concerns in our larger cities turning out articles spun on the lathe in the same manner as the original craftsman.

CHAPTER II

TOOLS AND MATERIALS

THE LATHE

For most varieties of metal spinning the lathe (Fig. 2) should have a variable speed headstock capable of taking a heavy end thrust. Considerable friction is developed in metal spinning, and to do good work a constant flow of power is necessary. Some spinning lathes have a variable unit-type, motor-driven headstock and can be adjusted to any speed from 800 to 2400

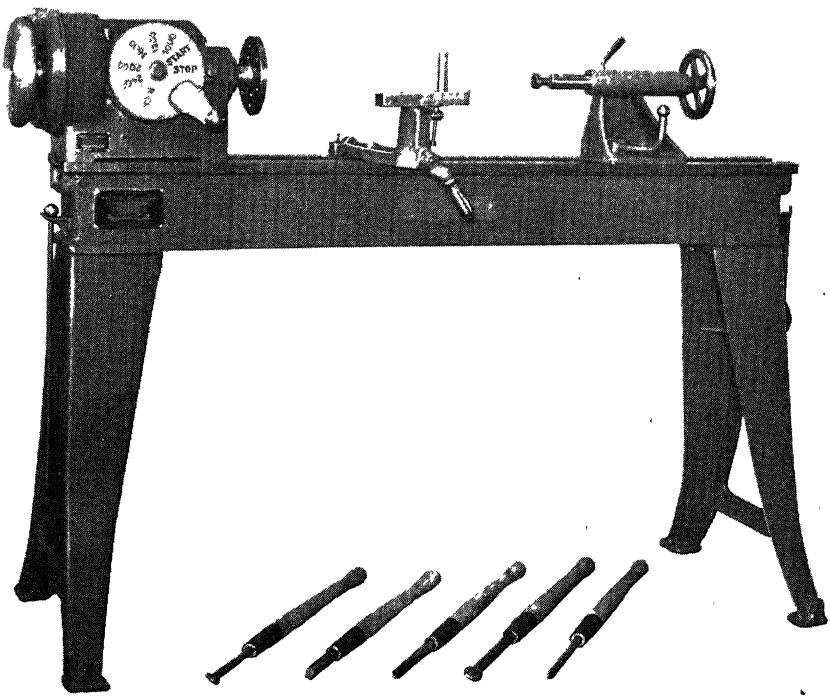


Fig. 2. The Spinning Lathe and Tools

r.p.m., as may be required by the size and particular nature of the metal being spun. In these lathes the headstock should also have a substantial thrust bearing to withstand a heavy constant pressure.

An ordinary faceplate may be used to hold the chuck while spinning. If enough faceplates are not available, it is much more convenient to bore a hole in the chuck and tap it to fit the lathe spindle.

The ordinary tailstock found on most wood lathes will be found satisfactory for the average spinner. It will, however, be necessary to use a spinning center in place of the regular center.

SPINNING TOOLS

Spinner's tools (Figs. 2 and 3) can be placed in three classes: blunt tools, beading tools, and cutting tools.

The average beginner's set should include the following: (1) flat tool; (2) diamond point cutting-off tool; (3) point tool; (4) planishing tool; and (5) beading tool.

There are many other tools used by professional spinners in production

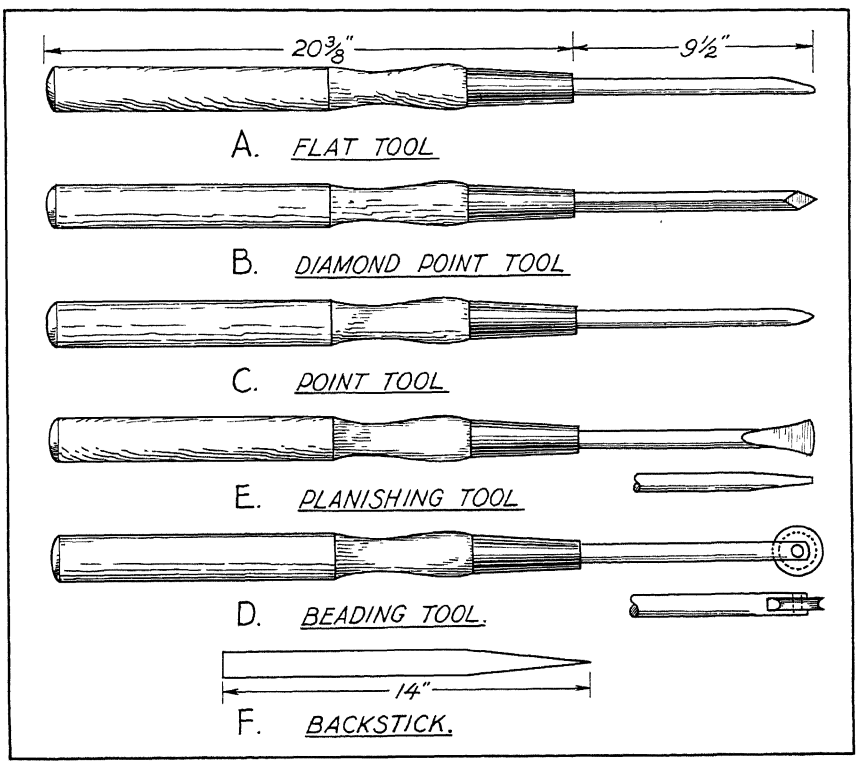


Fig. 3. The Spinning Tools

work, but very satisfactory results can be obtained with the tools just mentioned.

THE FLAT TOOL

In metal spinning, the flat tool (Fig. 3A) is used more than any of the others. One portion of the tip is flat for smoothing purposes and the opposite side is flat for breaking down and spinning to the chuck. The portion where the flat joins the round is also rounded, but to a sharper radius, so that this edge can be used to bear into sharply rounded fillets. The flat is practically the only one needed for forming and finishing soft metals, such as pewter and aluminum.

THE DIAMOND POINT TOOL

The diamond point (Fig. 3B) is used to trim excess metal from the lip of the spun object and for rounding off sharp edges.

THE POINT TOOL

The point tool (Fig. 3C) is used for bearing into curves of small radii, with both concave and convex surfaces.

THE BEADING TOOL

The beading tool (Fig. 3D) is used for turning the edge of a spun bowl to a beaded lip. It can also be used for grooving shallow decorative motifs around bowls. In the ordinary beading tool the rolls are interchangeable. The beading wheel can vary from 1 to 2 in. in diameter.

THE PLANISHING TOOL

It is necessary to have a finishing tool to remove any marks that might be left from any of the other tools. For this purpose, the planishing tool (Fig. 3E) is commonly used. The edge of the tool at its end may also be used to make small grooves or shoulders in the shell.

THE BACKSTICK

The backstick (Fig. 3F) is another necessary tool. It can be made from a broom handle and tapered at the end like a chisel. Its chief function is to provide pressure behind the spinning tool in the breaking-down process. It can also be used to prevent wrinkling of the metal at the edges.

THE SPINNER'S CENTER

A spinner's center (Fig. 4) can be made from an ordinary tail center by purchasing two bearing races and one thrust bearing. Place one thrust between two bearing races and slip them over the dead center.

Excellent spinner's centers can be purchased from commercial companies specializing in their manufacture. These centers are very dependable and can be used for an indefinite period of time.

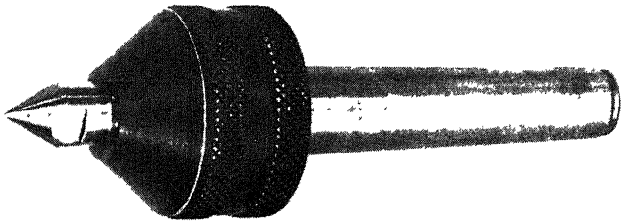


Fig. 4. The Spinning Center

THE SPINNING REST

The principle of the spinning rest (Fig. 5) is practically the same as that of a wood lathe tool rest except that vertical holes are bored into it at intervals for holding a steel pin which acts as a fulcrum for the tool. A very good rest can be purchased for about two dollars.

The average mechanic can easily construct a spinning rest if he has a drill press heavy enough to do the required drilling. A very good idea of the construction of one of these rests is shown in Figure 5.

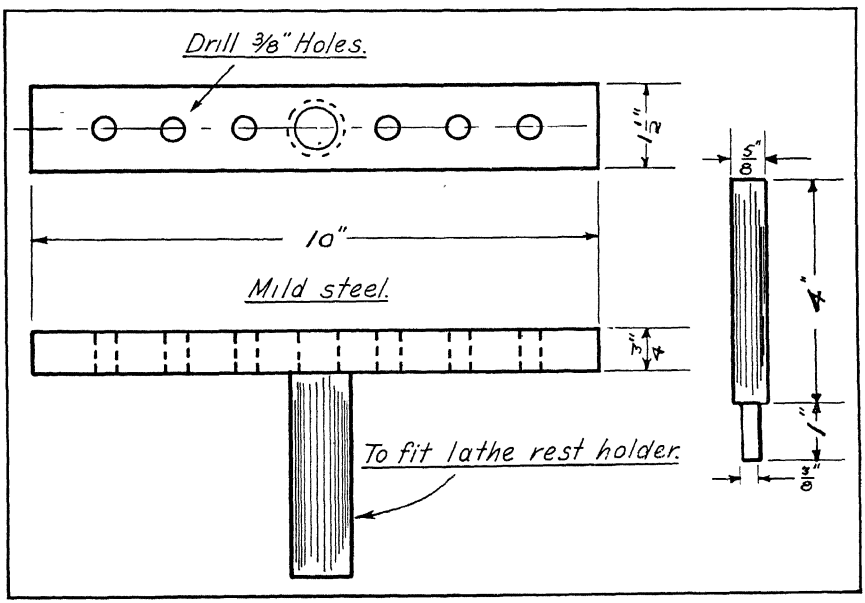


Fig. 5. The Spinning Rest

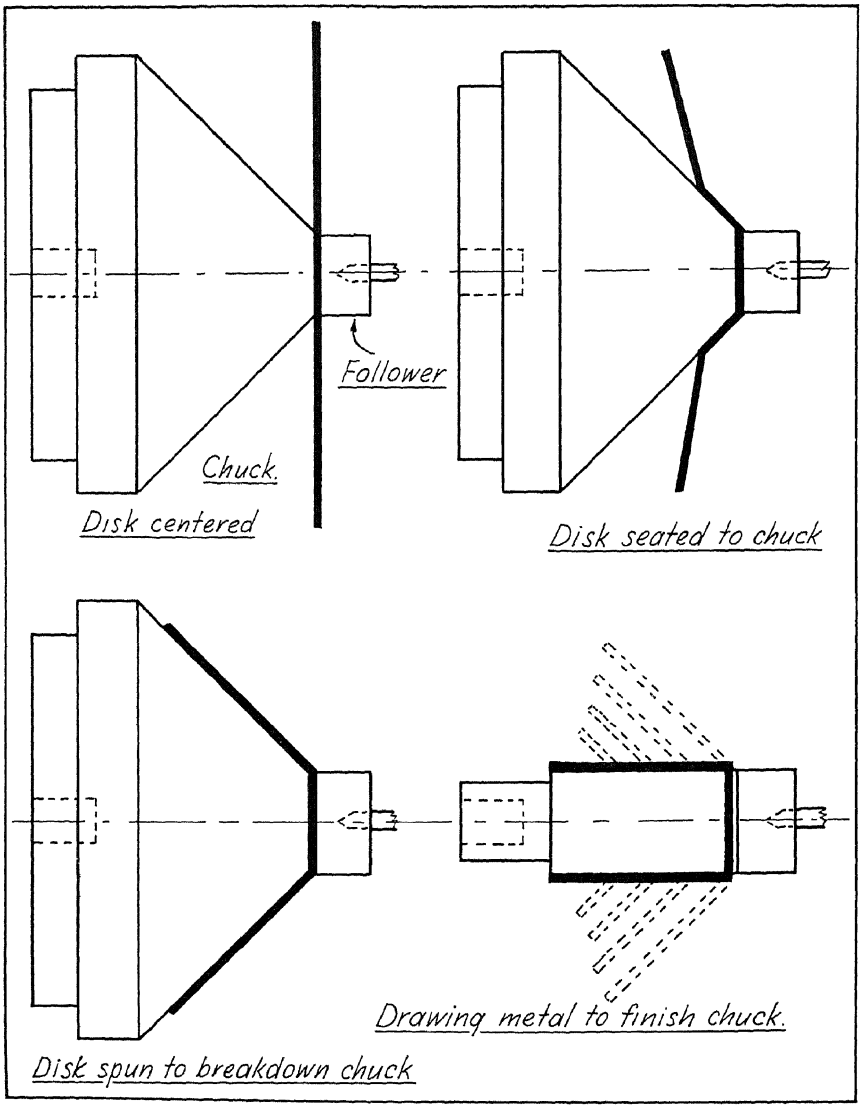


Fig. 6. The Breakdown Chuck

THE CHUCK

The chuck may be described as the form over which the spinning is done.

Chucks may be turned from either wood or metal. Wooden ones may be made easily by anyone having a small amount of knowledge of wood turning. If they are to be used repeatedly, it is best to make them of hardwood. Birch, maple, gum, or walnut are very satisfactory. If soft materials are

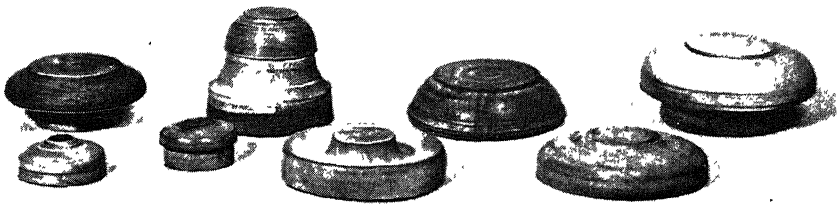


Fig. 7. The Wooden Chucks

used, they must be resurfaced frequently. Maple probably is the best of the woods, and may be used many times without resurfacing.

Chucks may be glued from 2-in. circular blanks. They may be fastened to the faceplate with screws or threaded to fit the lathe spindle. A tap may be purchased to thread the chuck, or a hole may be bored in the chuck ⅛-in. smaller than the lathe spindle which may serve as a tap. The chuck may then be turned to any desired shape and sanded smooth.

It is almost impossible to spin some forms without first making a breakdown chuck (Fig. 6). Projects with tall, straight sides, like the creamer shown in Figure 57, require considerable skill in spinning in order to avoid spoiling the metal. The pressure of the tool places a strain on the metal at the base, causing it to tear at this point if the pressure is too great, or applied for too long a time. This may be avoided by the use of a breakdown chuck, which permits the spinner to change the point of strain. The chuck for the project should be made first and the base of the breakdown chuck should match the regular chuck.

FOLLOW BLOCKS

The follow block (Fig. 8), generally made of wood, is a fixture used to hold the metal blank against the chuck. It must revolve freely and at the same speed as the chuck. Any slippage will either burn the wood or the metal.

The follow block should be at least 1 in. thick and never larger that the diameter of the base to be spun. If it is too small, there is danger that the metal may be spun back over the block. If the block is too large, it is difficult to work in close to the base.

A hole should be bored in the center of the block to fit the friction unit of the center. *Do not bore all of the way through the block as the resulting hole will leave a mark on the soft metal.*

Instead of turning the follow block on a screw-center faceplate, center it right behind the wood chuck, and bring up the tailstock center and turn it to size. The face of the follow block should be turned to fit the base of the object being spun.

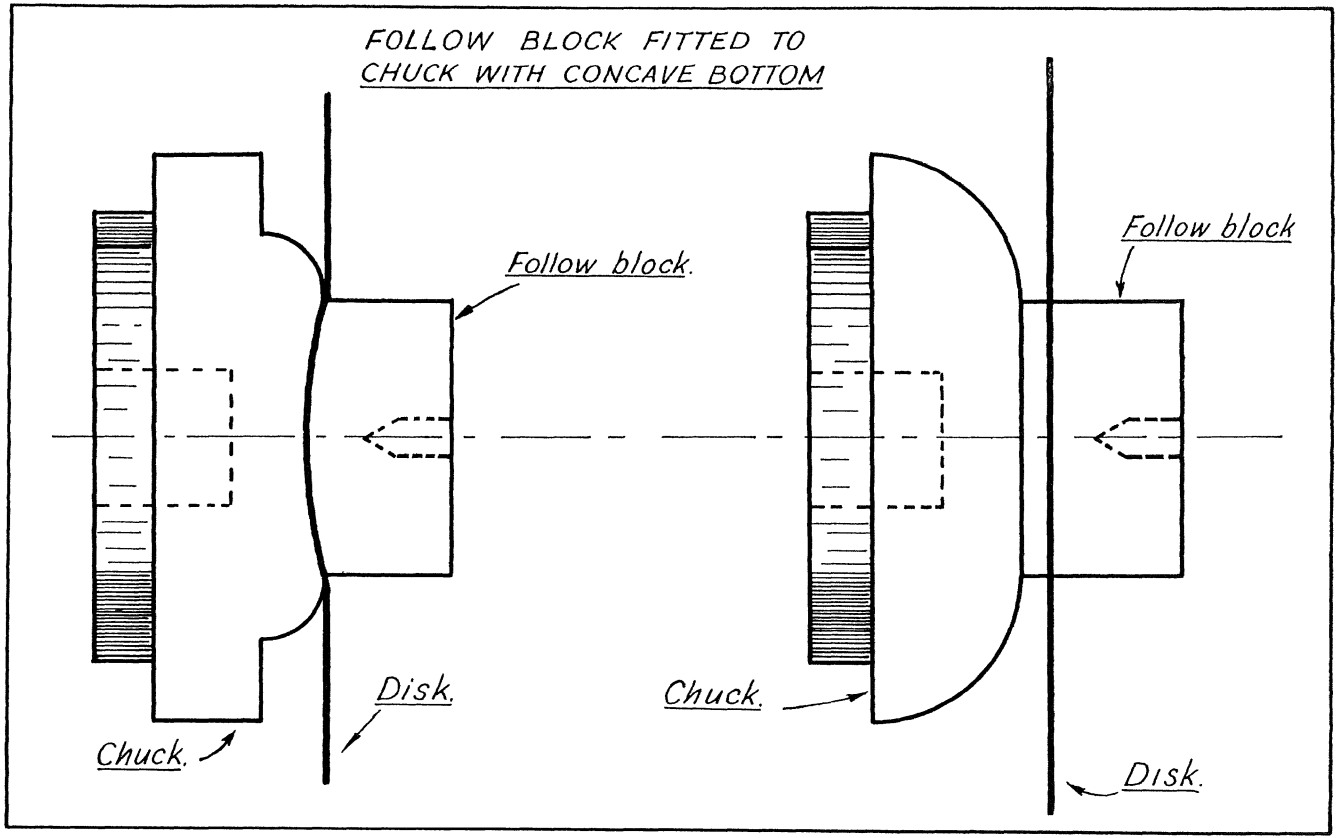


Fig. 8. Follow Blocks

SPINNING LUBRICANTS

The friction set up while spinning makes it necessary to use a lubricant on the surface of the metal while it is being spun. This lubricant prevents the tearing of the metal.

As an effective lubricant for pewter, copper, and aluminum cup grease or laundry soap can be used. Tallow candles make an excellent lubricant for hard metal. A very good lubricant for pewter and copper can be made by dissolving a half cake of laundry soap in 1½ pt. of water. After this mixture has been dissolved add 1 pt. of No. 30 lubricating oil and stir thoroughly. After it has stood for 12 hrs. it will be ready for use. The lubricant may be applied with a brush or any other dauber, such as a piece of cloth wrapped around a stick.

METALS

Pewter, copper, and aluminum are the three most common metals used by the beginner in spinning.

Pewter has been long used for household purposes. First produced by the Romans, its popularity and manufacture increased until, in the Middle Ages, it was practically the only metal used by the upper and middle classes. Thereafter the introduction of earthenware and china brought pewter into disuse, and, at the end of the eighteenth century, it had been entirely supplanted by other materials. The twentieth century, however, brought forth renewed interest in pewter among metal craftsmen.

Pewter is an alloy, which during the ages, has been changed in composition to a remarkable degree. It is generally considered to be an alloy of 80 per cent tin and 20 per cent lead. In France pewter for drinking vessels or food containers is restricted by law to a maximum of 18 per cent lead to avoid lead poisoning. In England the lead content is restricted to about 10 per cent.

In America manufacturers of pewter have excluded the lead entirely which is responsible for the popularity of pewter articles in this country. This lead-free pewter does not turn dark gray as the pewter containing lead. It is sometimes called Brittania metal.

Brittania metal is of English origin dating back to the year 1780. The composition of this metal is 91 per cent tin, 7½ per cent antimony, and 1½ per cent copper. The antimony and copper is added to harden and stiffen the tin.

Pewter lends itself perfectly to the beginner's purposes because it spins so easily, does not harden during spinning, and, therefore, does not have to be annealed.

Copper is very popular among students and craftsmen because it is not quite as expensive as pewter. It is slightly more difficult to spin than pewter as it becomes hard and springy from the pressure and must be

annealed frequently. Copper may be annealed by heating it to an iridescent color and then plunging it into cold water. This metal works up beautifully and takes a brilliant polish, which has to be lacquered to prevent tarnishing.

Aluminum is very easy to spin, having many of the desirable qualities of pewter. It is harder than pewter yet spins easily and takes a very high polish.

CHAPTER III

FUNDAMENTALS OF METAL SPINNING

An almost endless variety of articles can be spun from the softer metals such as silver, pewter, copper, brass, and aluminum.

To determine the proper size disk to be spun, take the radius plus the depth of the chuck, and use that as the radius of the blank. Another method is to add the largest diameter to the height; the sum is the diameter of the disk.

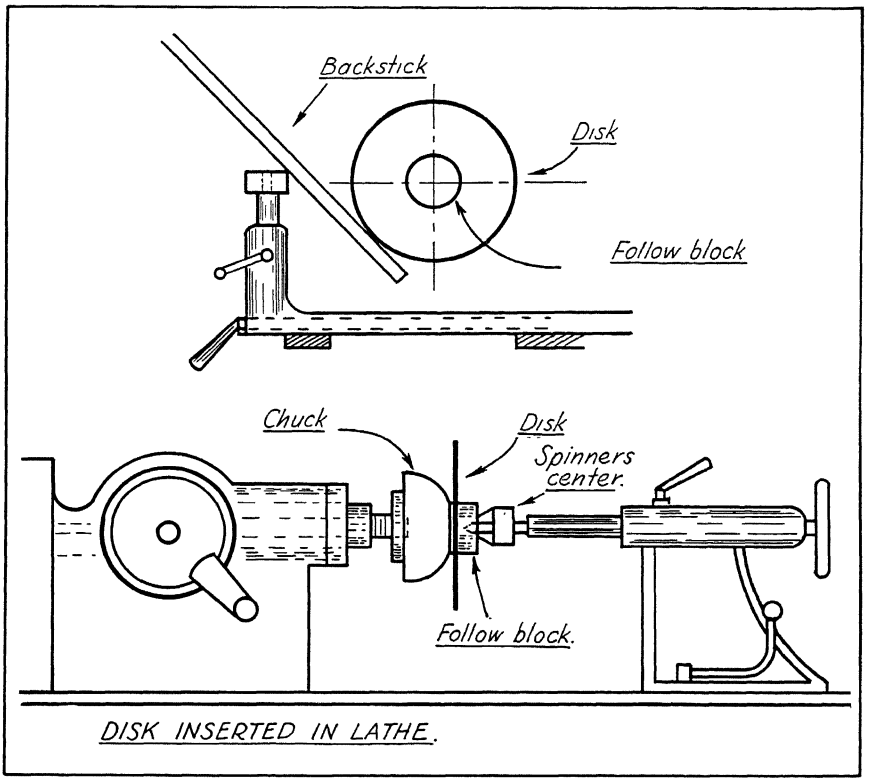


Fig. 11. Centering the Disk

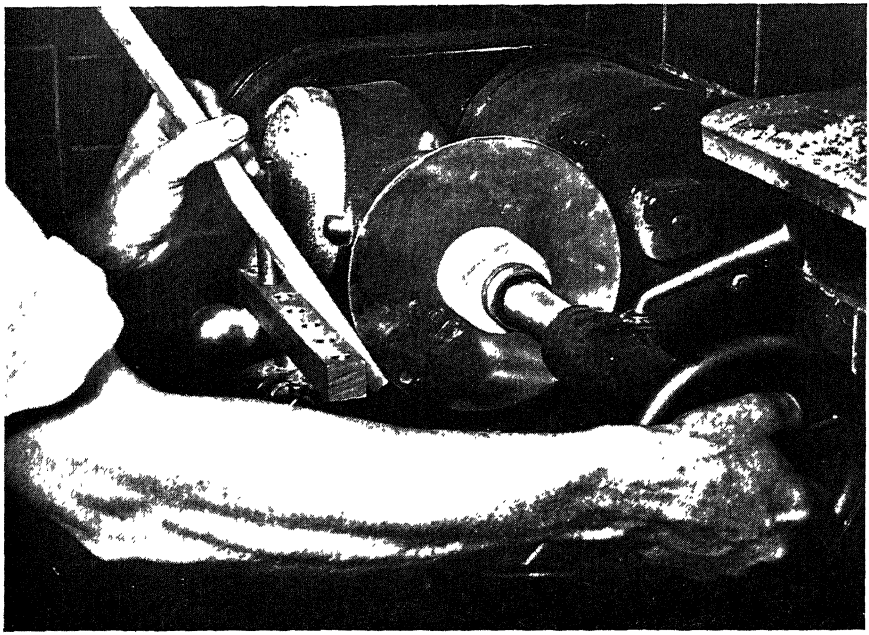


Fig. 12. Centering the Disk

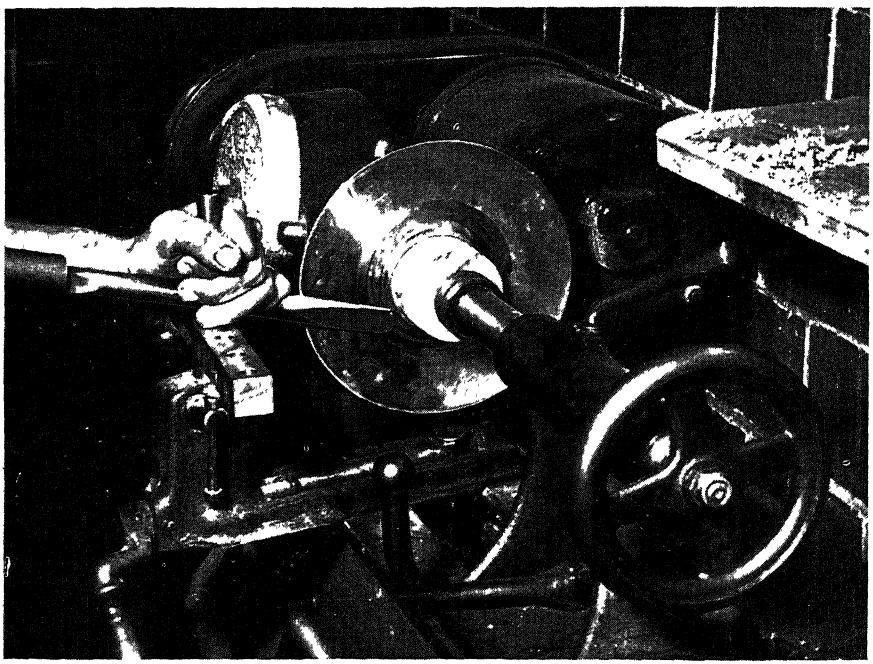


Fig. 13. Seating the Disk

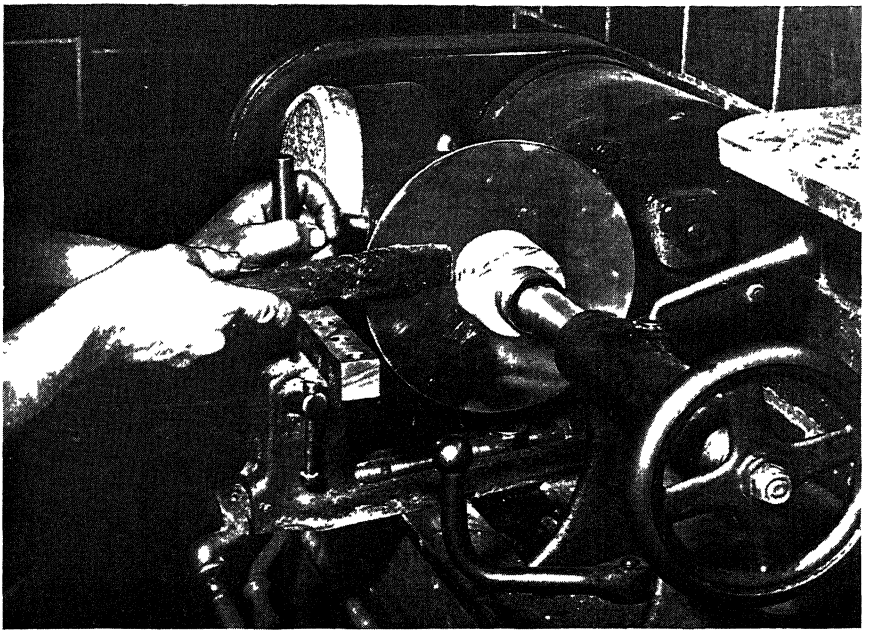


Fig. 14. Lubricating the Disk

In starting the spinning process the chuck should be screwed firmly to the lathe spindle. The blank or disk is then inserted between the chuck and the follow block. If the disk has a hole in the center, the end of the spinning center should pass through the disk into the hole bored in the chuck.

The beginner in spinning usually finds it rather difficult to center the disk. One of the best methods (Figs. 11 and 12) is to place the disk against the chuck and pull up the follow block just tightly enough to hold the disk in place. Try to get the disk as near to the center as possible. Set the tool rest back from the disk about 3 in. and parallel to the lathe bed. The backstick should now be placed under and against the metal with the stick resting firmly on the spinning rest. Start the lathe at a slow speed. *Do not stand in line with the disk, as it might fly from the lathe before it has been seated.* Loosen the tailstock slightly and touch the metal with the backstick and then tighten the tailstock quickly. The disk should now be perfectly centered.

Seat the disk as soon as possible (Fig. 13). Do not draw it up too tightly on the follow block as too much pressure from the tailstock will cause wear on the thrust bearings of the lathe. The blank should now be lubricated while it is rotating (Fig. 14).

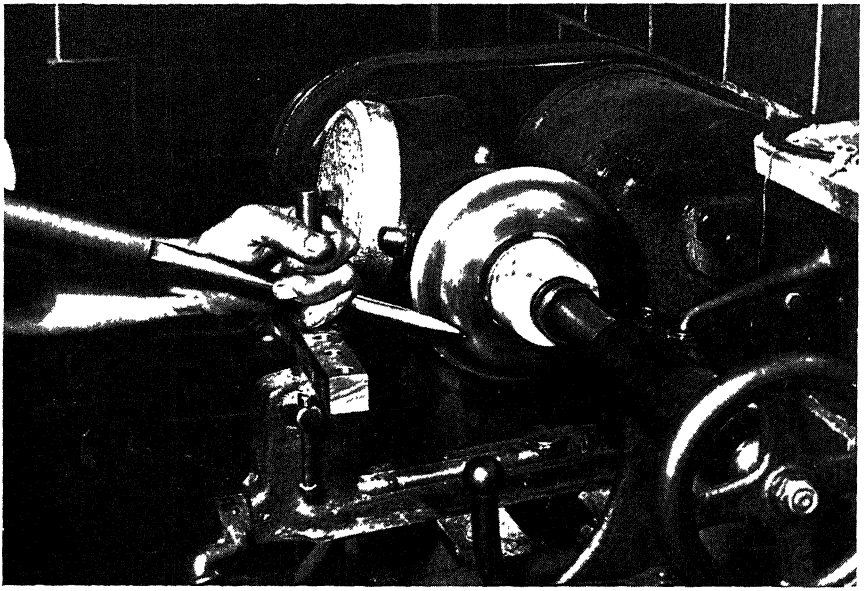


Fig. 15. Spinning the Disk to the Chuck

The tool rest should be placed in position so that the edge of the disk clears it.

Start the lathe at a slow speed because the disk might fly from the lathe if the speed is too high before the disk has been seated. The spinning should be started with the flat tool, which should be held in position on the left side of the fulcrum pin. The handle of the tool should be placed under the right arm next to the body. Steady the tool against the rest by grasping the fulcrum pin with your fingers. Seat the disk against the chuck with a single stroke of the tool to the left (Fig. 13). Work the tool back and forth in a short radius. After the disk has been firmly seated against the chuck there is little danger of it flying out.

The secret of successful spinning is to learn the correct amount of pressure needed to spin the metal to the chuck. If too much pressure is applied to the blank, the disk will wrinkle or the tool will break through the metal. The spinning tool should be kept in motion. If left in one spot too long it will cause rings to be formed on the surface. Use the upper part of your body to move the tool.

Avoid working the tool continuously from the center of the disk as this will thin the metal to a breaking point. Instead, work the tool back and forth in a short radius.

Much of the success in metal spinning comes from practice and from

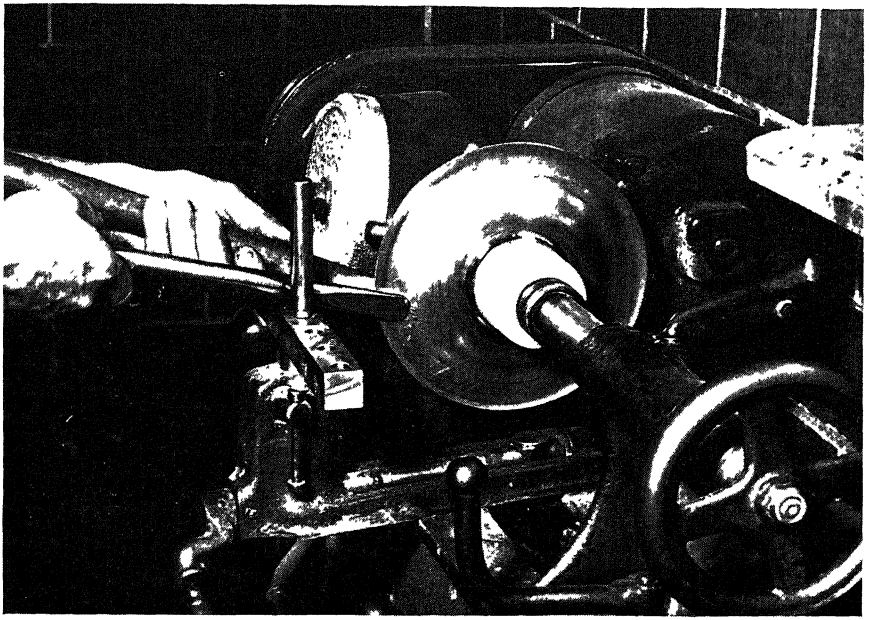


Fig. 16. Using the Backstick

learning the "feel" of different metals against the tools. The beginner will find that unless he is very careful the disk will have a tendency to wrinkle and buckle, which is one of the most discouraging features of learning to spin. It is caused mostly by changing the form of the metal too rapidly without having the proper support under the metal. Wrinkling can be avoided by the proper use of the backstick, which should be held on the other side of the metal and directly opposite the tool (Fig. 16). Equal pressure should be exerted on the tool and the stick as both are worked toward the form. The metal should not be worked with too great a pressure. Some spinners use the backstick on top of the tool rest and others use it below.

It is advisable to learn to spin pewter because this metal is soft. If wrinkles appear they may be removed by hammering it lightly over a wooden form with a wooden mallet. If copper is used and wrinkles appear the metal will have to be annealed.

Before the last ½ in. of metal is laid down to the chuck, turn the disk to size with the diamond-point tool (Fig. 17). The tool rest should be moved as close as possible to the disk.

If a bead is desired, place the flat tool against the right side of the metal, and with the backstick force the rim back slightly to the right (Fig. 18).

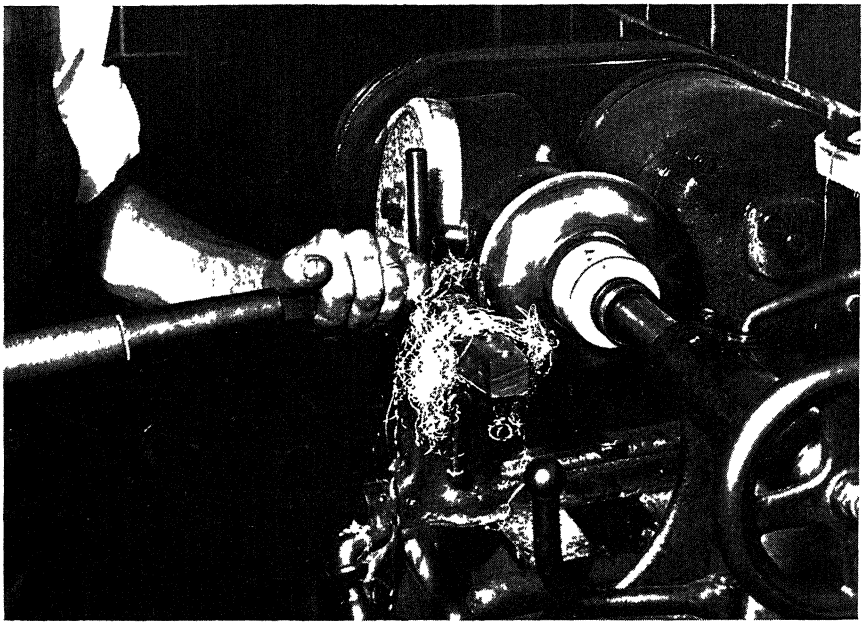


Fig. 17. Trimming with a Diamond-Point Tool

The edge may now be rolled entirely over, either the flat or beading tool may be used to finish the roll (Fig. 19). Sometimes the shell is spun too tightly to the chuck and is difficult to remove. In this case the entire shell

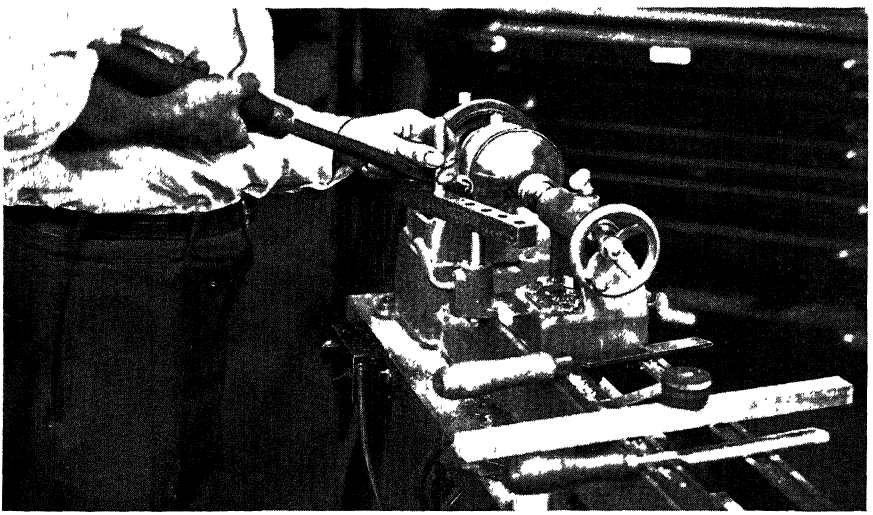


Fig. 18. Spinning a Rolled Edge

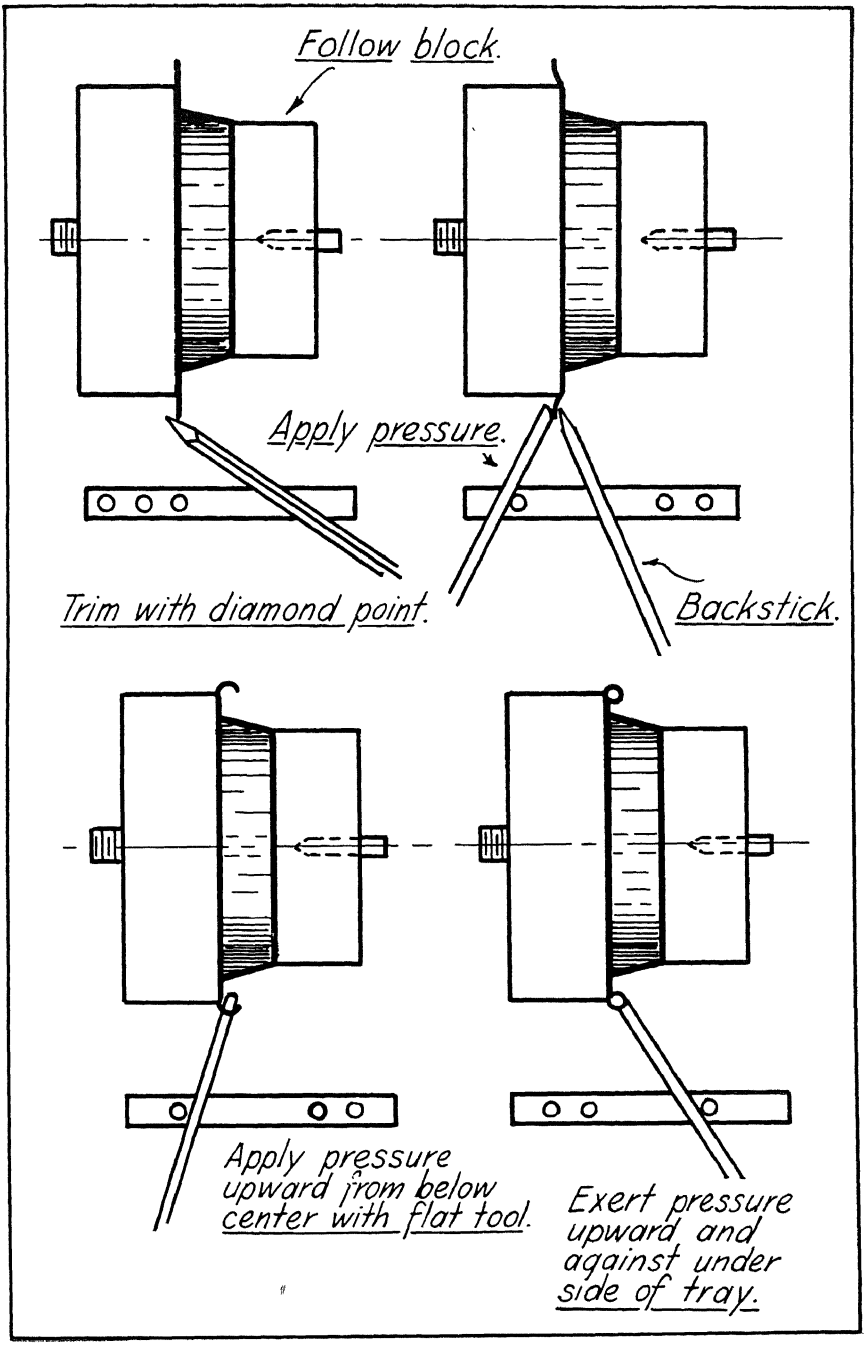


Fig. 19. Turning a Rolled Edge

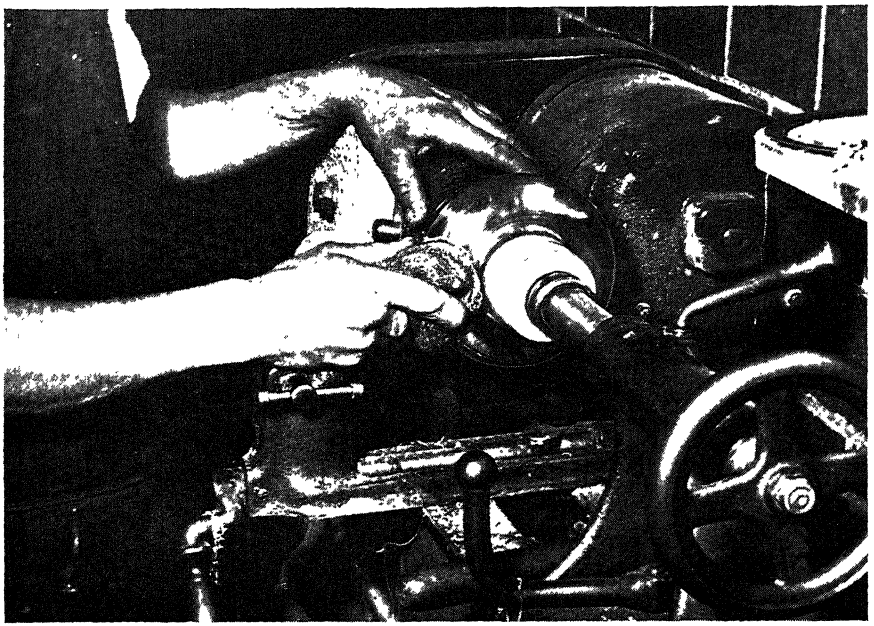


Fig. 20. Polishing with Steel Wool

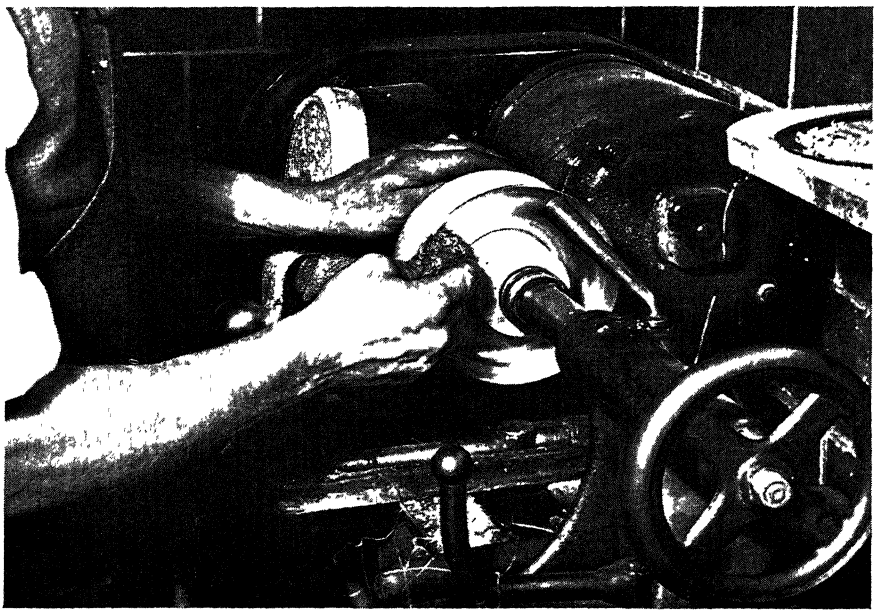


Fig. 21. Polishing the Inside of the Bowl

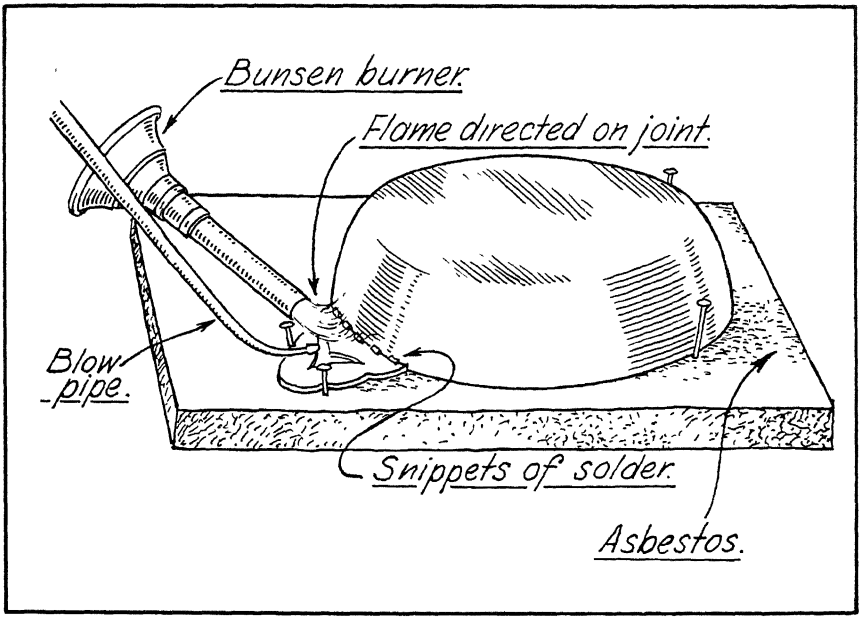


Fig. 22. Soldering

may be gone over with the flat or a planishing tool and be easily removed. Another method is to place the palm of the hand on the shell while it is revolving in the lathe. The friction will cause the metal to heat and expand.

After the article has been spun the lubricant can be removed with gasoline. The shell should be polished with very fine steel wool while still in the chuck (Figs. 20 and 21). The project can then be buffed with tripoli and finished with fine rouge. A clear lacquer should be applied with a spray gun or a fine brush to prevent tarnishing.

SOLDERING

It will be found necessary in the spinning of metal to learn how to join two pieces of metal together with solder.

The soldering of pewter presents some difficulties. The melting point of the pewter and solder are so close that unless one is very careful he will spoil the project by melting the pewter. If the joining process is done properly it is difficult to detect where the two parts have been soldered together.

An ordinary bunsen burner or an alcohol lamp may be used in soldering pewter. Both require a mouth-type blowpipe. *Never use a soldering copper as the concentration of heat when it touches the metal will melt a hole*

in the pewter. The project should be set upon a piece of asbestos while soldering (Fig. 22).

Small snippets of solder should be placed on the joint. The student can gain experience in soldering pewter by practicing on small pieces of scrap. The best type of solder to use is the solder known as 60–40 solder which melts at 370 deg. F. while pewter melts at 425–440 deg. F. Where special precautions are necessary against melting pewter, bismuth solder may be used.

A flux should always be used to prevent the metal from oxidizing and to make the solder flow freely. This flux can be made by adding 10 drops of hydrochloric acid to 1 oz. of glycerin. The flux should be applied liberally to the joint.

In soldering be sure and keep the flame moving because if it is concentrated at any one point the pewter will melt at that spot. After applying the flame the flux will soon start to boil and very shortly afterward the solder will melt and run into the joint. The solder will always run toward the hottest part of the metal. *Do not use too much solder*. The final cleaning of the joint may be done with 2/0 emery cloth.

In soldering copper or any of the harder metals a soldering copper may be used.

PROJECTS

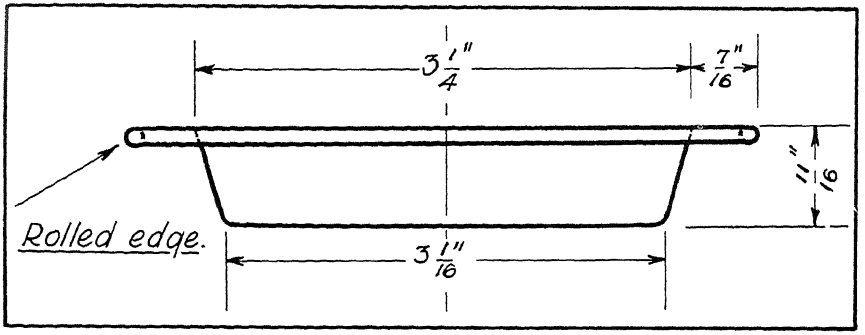
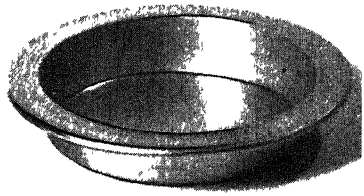


Fig. 26. Ash Tray



1. ASH TRAY

1. Select a piece of well-seasoned hardwood, 1½ by 3½ by 3½ in., for the chuck.

2. Scribe a circle with the dividers and cut it to size with a scroll or band saw.

3. Bore a hole in the chuck and tap it to fit the spindle. Then turn the chuck to the given dimensions and sand it smooth.

4. Turn the follow block 3 1/16 in. in diameter.

5. Drill a hole in the center of the follow block and fit it to the spinning center.

6. This project should be made of 18-gauge pewter, but copper and brass also may be used.

7. Place the center of the disk against the bottom of the tray chuck and draw up the follow block until it holds the disk in place. Lubricate the disk with the soap mixture. The disk may be centered while the lathe is in motion. Place the center of the disk against the bottom of the chuck, draw up the follow block until the disk begins to pull slightly, then let the disk go and quickly tighten the follow block against it. If the disk is off center, release the follow block slightly, and place a piece of wood against the disk so that the pressure will cause the disk to center itself. When properly adjusted tighten the follow block and start spinning.

8. Set the fulcrum pin a little to the right of the disk. Place the spinning tool under the right arm, to the left, and against the pin. Exert pressure on the revolving disk at the bottom of the chuck so that the metal will be spun against it, on the first operation. This will seat the disk. Now ply along the disk forcing the metal over the chuck. Do not use too much pressure. If the edge of the disk ripples, use the backstick on the opposite side of the spinning tool.

9. When the metal has been spun over the form, trim it to size.

10. While the chuck is still in motion, clean the tray with fine steel wool and buff it with rouge.

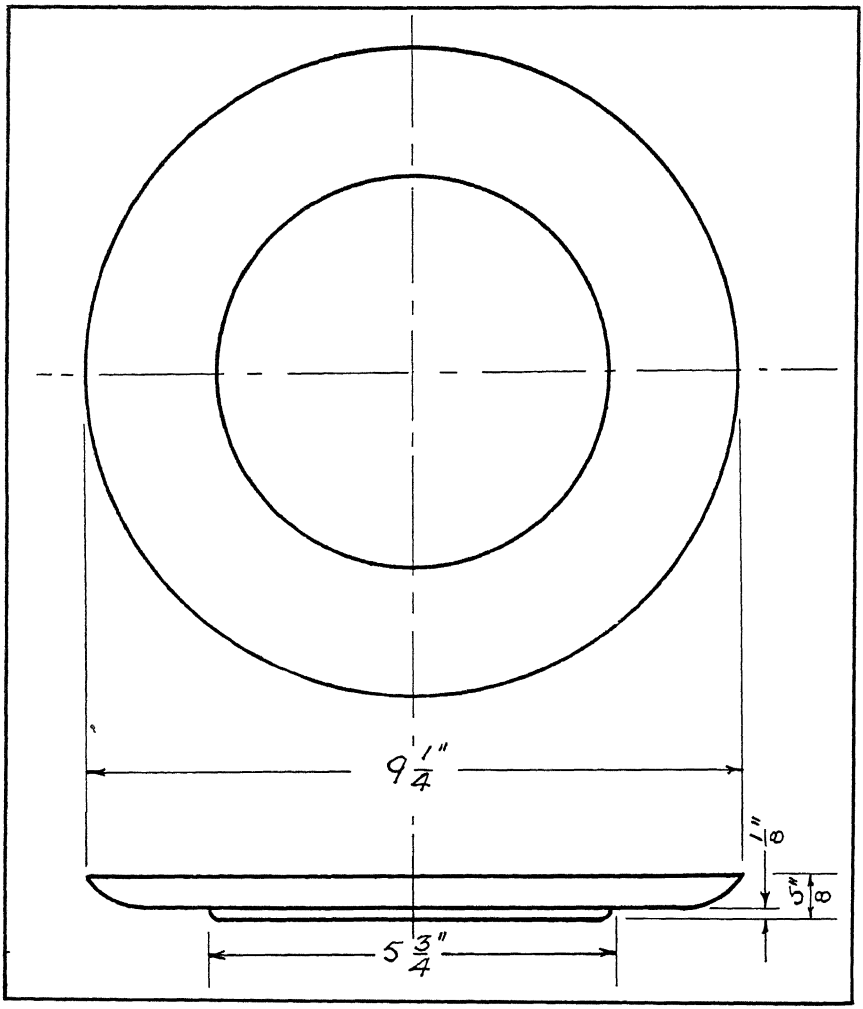


Fig. 28. Tray

2. TRAY

1. Make the chuck from a piece of maple, 1½ by 9½ by 9½ in.
2. Scribe a circle with dividers and cut the chuck to size on a scroll or band saw.
3. Bore the hole and tap it to fit the lathe spindle. Then turn the piece to 9¼ in. in diameter and sand it smooth.
4. Turn the follow block to 5¾ in. in diameter from 1¼-in. stock.
5. Drill a hole in the center of the follow block to fit the spinning center. If desired the hole may be drilled into the follow block which may be brought up against the chuck and turned to fit the 5¾-in. diameter.
6. Place the center of the disk against the bottom of the tray chuck and draw up the follow block until it holds the disk in place. Be sure that the disk is properly centered.
7. Lubricate the disk with the soap mixture (see p. 19).
8. With the flat tool, seat the disk against the chuck. Work the tool along the disk forcing the metal against the chuck. Avoid using too much pressure. If the tray is made of copper it may be necessary to anneal the metal before the spinning is completed.
9. The metal may be smoothed with the planishing tool if the flat tool has left any grooves.
10. Before the last ¼ in. has been laid down to the chuck trim it to size.
11. Polish the tray with fine steel wool while the chuck is in motion.
12. Finally buff it with tripoli and finish it off with rouge.

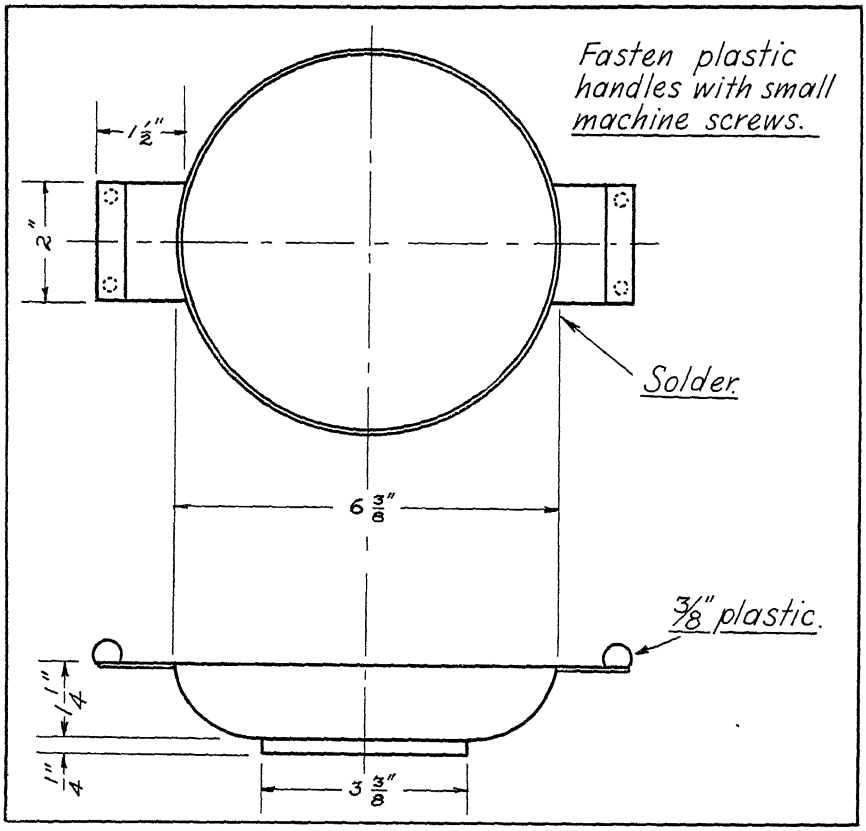
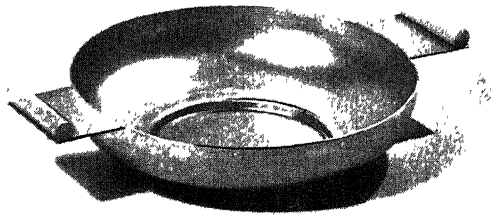


Fig. 30. Nut Tray



3. NUT TRAY

This nut tray not only affords practice in spinning but also training in the soldering of pewter. The latter is quite difficult because the melting point of pewter is nearly the same as that of solder. The round plastic rods that are fastened to the handles improve the appearance of the tray immensely.

1. The chuck for this project should be made from a piece of hardwood, 1½ by 6½ by 6½ in.

2. Bore a hole in the chuck and tap it to fit the spindle.

3. Turn it to the dimensions given in the drawing.

4. Make the disk of 18-gauge pewter and place the center of it against the bottom of the tray chuck and then draw up the follow block, which should be 3⅜ in. in diameter. If it is too small for the base of the tray the metal will flow back over it.

5. Lubricate the disk and start the spinning according to the instructions on page 24.

6. Turn the tray upside down on a flat board covered with asbestos. The handles may be held in place with brads (see Fig. 22). Apply the soldering flux (10 drops of hydrochloric acid added to 1 oz. of glycerin).

7. Lay a number of small pieces of solder along the joint. Apply heat by means of an alcohol lamp and a blowpipe. Keep the flame moving so that the solder will follow the heat.

8. Cut two pieces of plastic rod, each 2 in. long. Drill and tap them to fit the small flathead machine screws. The handles should also be drilled and countersunk. File one side of the rod flat.

9. Buff the completed tray with tripoli and finish it off with rouge.

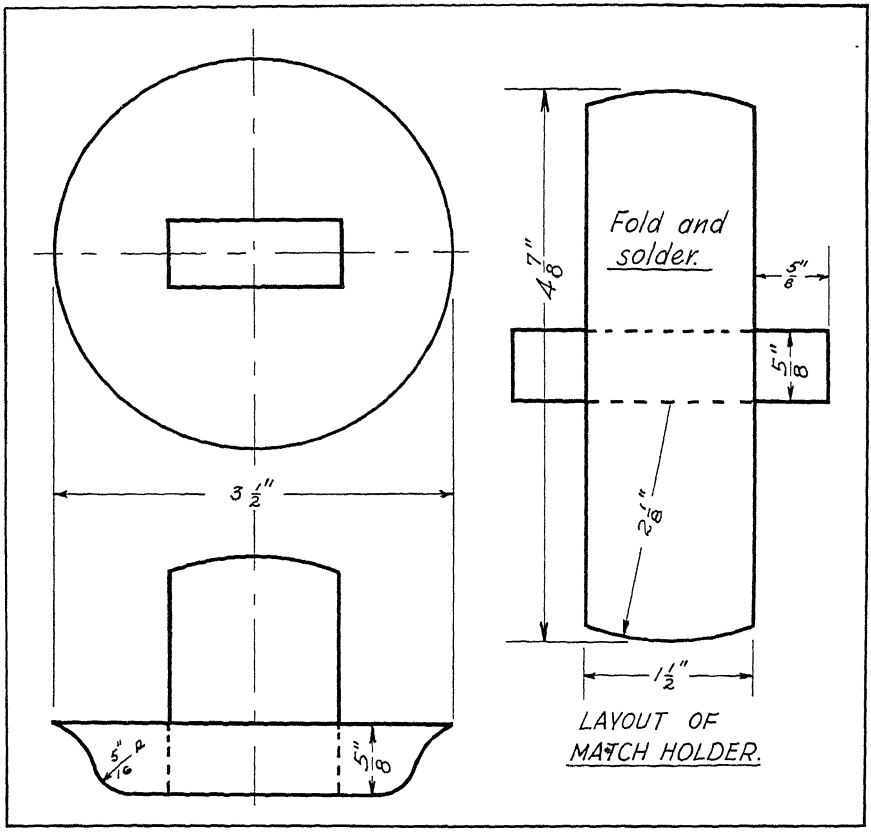
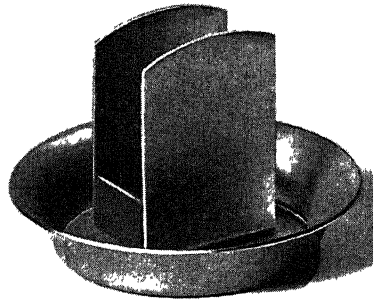


Fig. 32. Match Holder



4. MATCH HOLDER

The match holder can be easily constructed by beginners in metal spinning. Pewter, Brittania metal, or copper may be used, but pewter is perhaps the easiest for the beginner.

1. Construct the chuck from stock, 1 by 3¾ by 3¾ in.
2. Cut it to the dimensions given and turn it to 3½ in. in diameter on the lathe. The chuck may now be turned to conform to the shape of the tray.
3. A follow block of pine should now be made from a piece of material, 1¼ by 2 3/16 by 2 3/16 in. Then bore a hole to fit the spinning center.
4. Insert the disk and spin the tray to shape.
5. Lay out a pattern on paper for the match holder, which will take a piece of metal 2¾ by 4⅞ in.
6. Cut out the paper pattern and transfer it to the pewter with a scriber. Cut it to size with a tin snips and smooth the edges with a file.
7. Then fold the holder to shape.
8. Solder the holder to the inside of the tray.
9. Buff the completed tray with tripoli and finish it off with rouge.

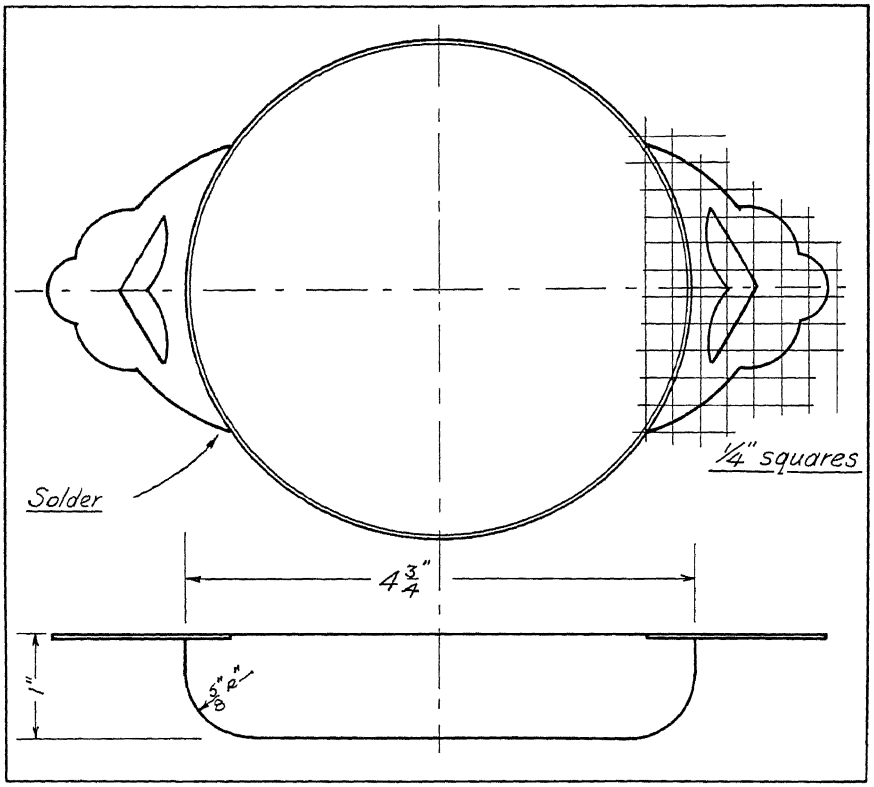
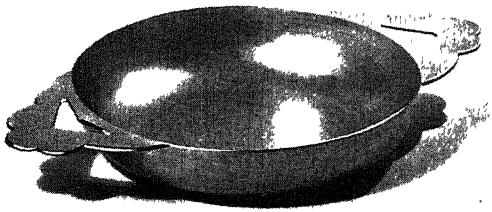


Fig. 34. Candy Tray



5. CANDY TRAY

The candy tray has proved to be a very popular project as it includes a variety of operations.

1. Cut the chuck from a block of wood, 1½ by 5 by 5, on the band saw.
2. Bore a hole in the chuck and tap it to fit the lathe spindle.
3. Turn the chuck to the given dimensions and sand it smooth.
4. Turn the follow block from a piece of 1¼-in. material to 3½ in. in diameter.
5. This project may best be made from 18-gauge pewter.
6. Center the pewter disk against the bottom of the chuck. Draw up the follow block and lubricate the disk with a soap mixture (see p. 19) and then start spinning.
7. Lay out ¼-in. squares on a piece of cardboard for the handle pattern and cut it out. Then transfer the design to the piece of pewter. Cut the outside edge of the handle with a pair of snips and smooth it to shape with a fine file.
8. The design in the handle may now be pierced with a jeweler's saw and smoothed with a fine file.
9. Solder the handles to the tray with a 60–40 solder according to the directions given on page 29.
10. Buff the completed tray with tripoli and finish it off with rouge.

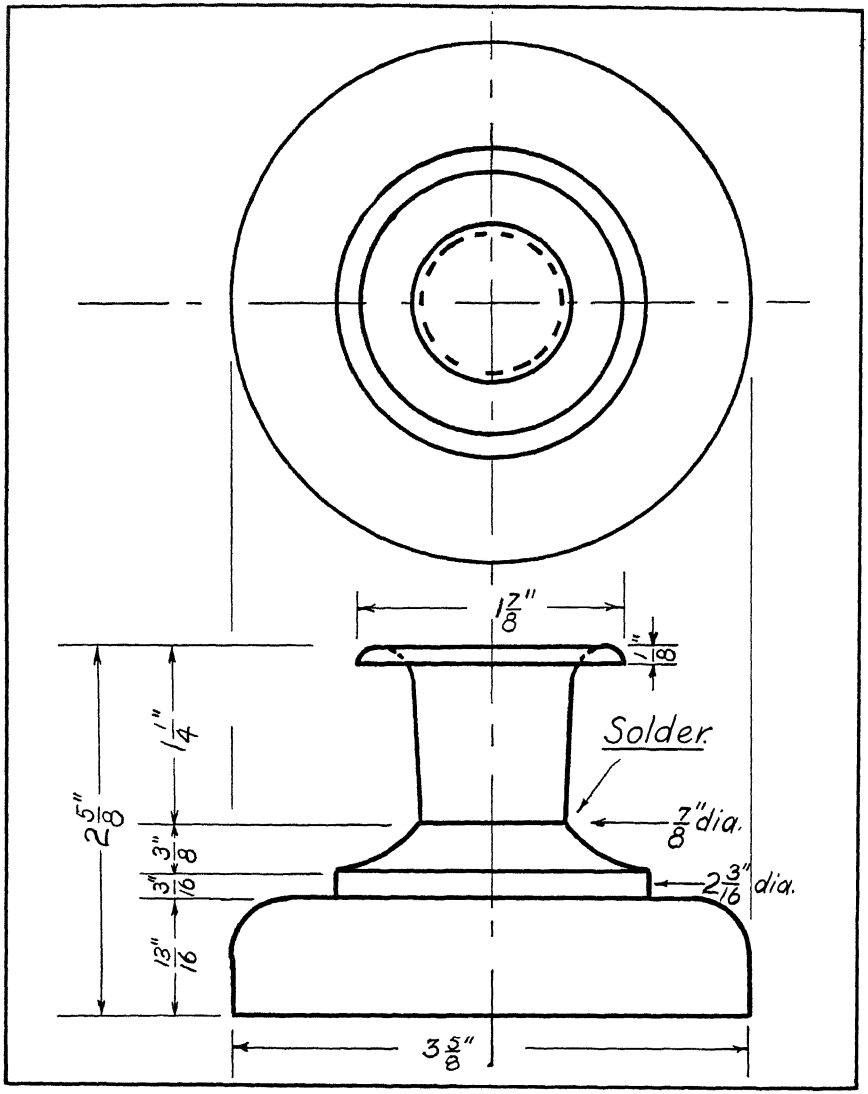
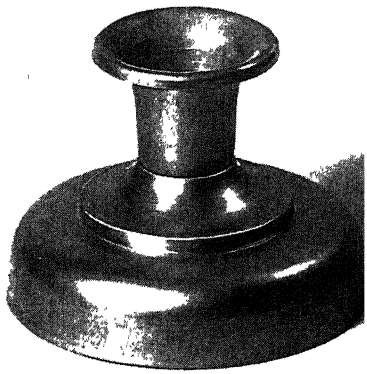


Fig. 36. Pewter Candlestick Holder

6. CANDLESTICK



A pair of these candlesticks with a spun pewter bowl makes a beautiful buffet set. The bottom of the candlestick can be spun very easily, but the candleholder is a little more difficult. The spinner will find that he has to work slowly and carefully to avoid rupturing the metal and to secure a neat job on the holder. Do not try to cover too great a radius at one time in spinning the holder; it might be best to practice on a few pieces of scrap before starting.

1. Two chucks are necessary for this project. The bottom one is made from a piece of maple, 2 by 3¾ by 3¾ in. the top one from a piece of stock, 2 by 2 by 2 in. Turn these pieces to the size and shape indicated in the drawing.

2. Place a disk of 18-gauge pewter against the chuck and draw up the follow block. Seat the disk against the chuck with the flat tool. The point tool may be used on the 2 3/16-in. diameter because this part of the candlestick is square and rather difficult to shape with any other tool without cutting the metal.

3. Polish the section before removing it from the chuck.

4. The upper part of the candlestick should now be spun to size, but first a follow block, ⅞ in. in diameter, will have to be made. Do not lay the last ¼ in. down to the chuck. Trim it to size with the diamond point and turn the edge over into a half roll. This may be accomplished by holding the backstick on the right-hand side opposite the flat tool which is used to roll the metal.

5. Polish the piece while it is still in the lathe.

6. One of the easiest methods for soldering the two parts together is to drill a 3/16-in. hole through the bottom part of the candlestick holder and melt solder through the hole. The solder will flow and hold the parts together without any of the solder showing on the outside.

7. The completed candlestick may now be polished and buffed.

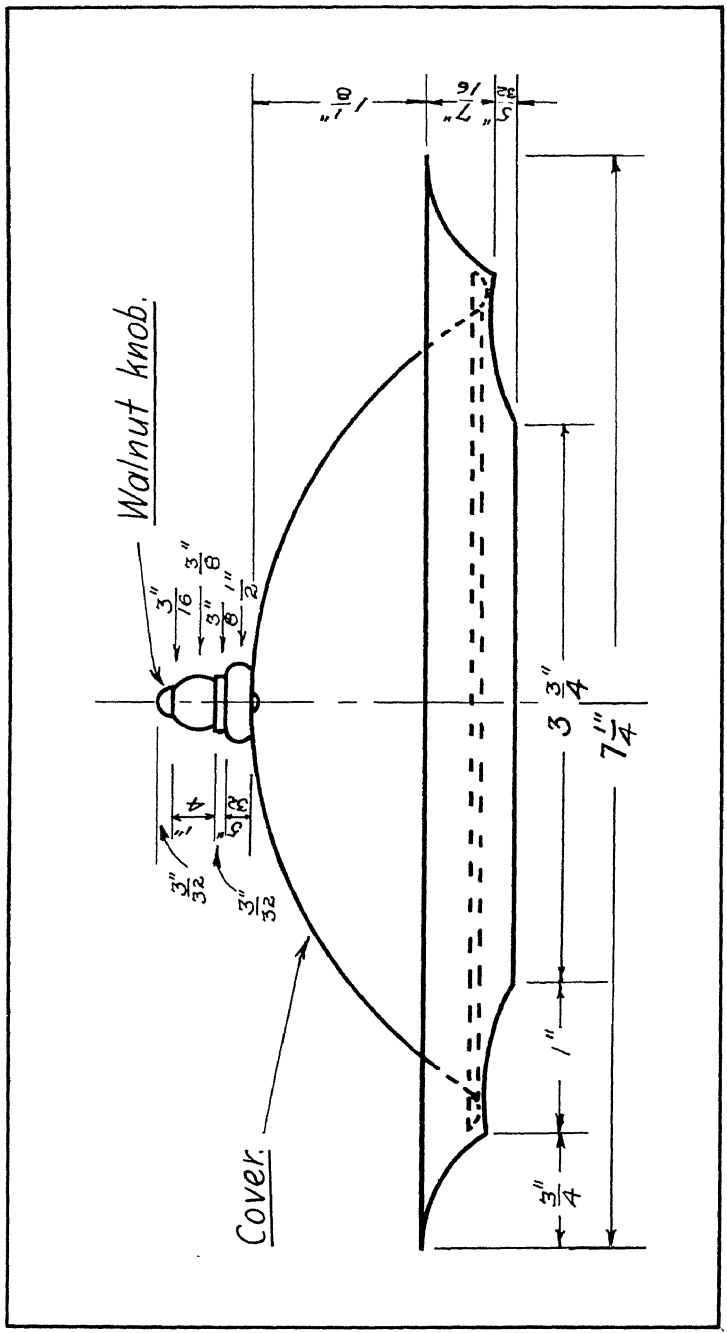
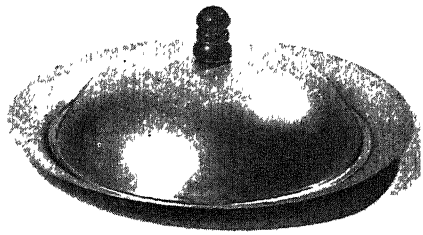


Fig. 38. Butter Dish



7. BUTTER DISH

1. It is necessary to turn two chucks for this butter dish. The one for the tray should be made from a piece of maple, 2 by 7½ by 7½ in. The other for the cover can be made from a piece, 3 by 6 by 6 in. Bore a hole and tap it so as to fit the lathe spindle.

2. The dimensions for the follow block are 1¼ by 3¾ by 3¾ in. Bore a hole in it to fit the spinning center.

3. Place the center of the disk against the tray chuck and draw up the follow block until it holds the disk in place. Lubricate the disk with the soap mixture (see p. 19). Start to spin the tray.

4. The follow block for the cover should be made of 1¼-in. stock, 1½ in. in diameter. It will have to be fastened to a small faceplate and the surface turned concave so as to fit the cover chuck. After the follow block has been turned, bore a hole in it to fit the spinning center.

5. Screw the cover chuck to the lathe spindle and insert the disk. *Care must be taken that the disk does not fly out while being spun* as there is no shoulder on the cover chuck to seat the disk.

6. Trim it to shape with a diamond-point tool before the last ¼ in. is turned to a half roll.

7. Polish the piece while the piece is still in the chuck.

8. Remove the cover and drill a ⅛-in. hole in the center of the cover for a small wood screw.

9. Turn a walnut knob according to the dimensions given in the drawing.

10. Give the knob a French polish with shellac while it is still in the lathe.

11. Fasten it to the cover with a small flathead wood screw.

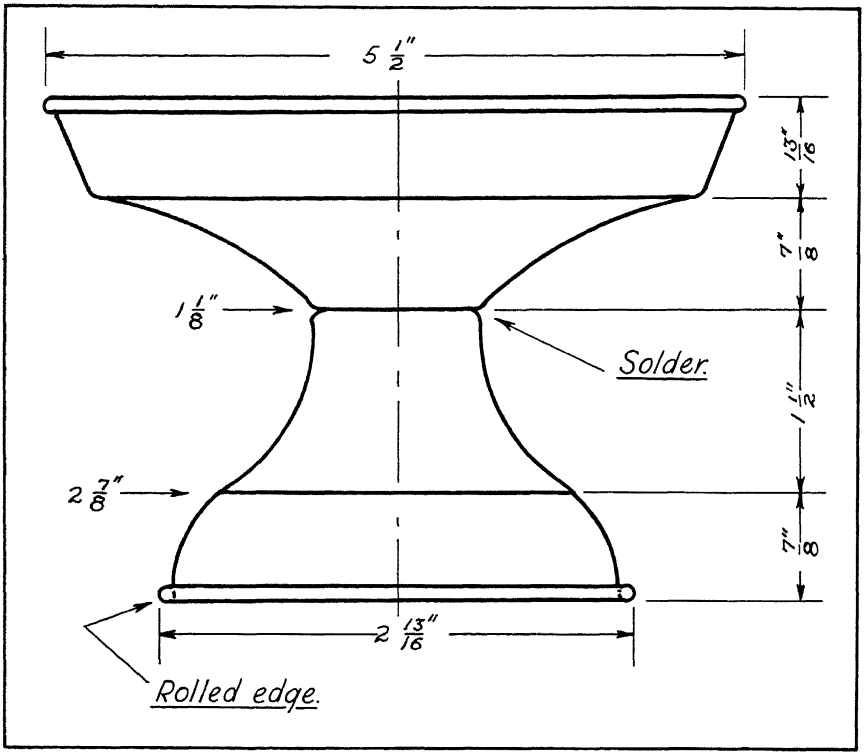


Fig. 40. Bonbon Dish

8. BONBON DISH

The bonbon dish is made up of two parts and does not include any complicated spinning.

1. It is necessary to construct two chucks for this dish. The one for the lower half should be made from 3-in. stock. Three 1-in. pieces may be glued together to get the required thickness. Cut it out on the band saw to a 3¼-in. diameter. Then turn it to size and sand it smooth.

2. Turn the follow block to 1⅛ in. in diameter, and bore a hole to fit the spinning center.

3. Place the disk in the lathe and spin it to the chuck.

4. Before the last ½ in. is laid down to the chuck trim it to size with a diamond-point tool, and with the backstick and flat tool spin a roll. The roll not only adds to the beauty of the dish but also strengthens it.

5. Turn a chuck for the top part of the dish from stock 2½ in. thick and 5¾ in. in diameter.

6. The same follow block may be used to spin the top half of the dish as was used in the lower half.

7. Proceed with the spinning. A roll should also be spun on this part of the dish.

8. Drill a 3/16-in. hole in the bottom half and join the parts together with solder.

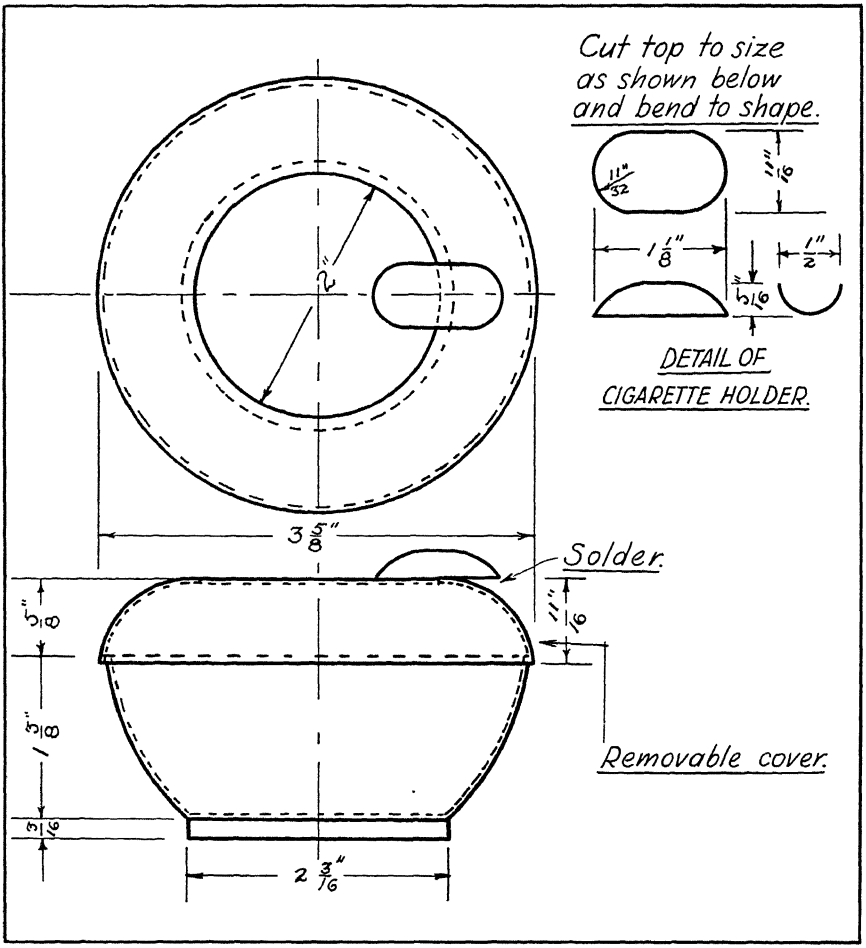
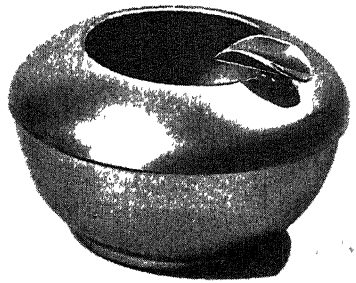


Fig. 42. Cigarette Ash Bowl



9. CIGARETTE ASH BOWL

The cigarette ash bowl will prove a popular project among students. It is made in two parts — the bowl itself and the cover.

1. Turn out the chuck for the bowl from a piece of maple, 2 by 3¾ by 3¾ in., and sand it smooth.

2. Turn out the follow block from a piece of white pine 2 3/16 in. in diameter. Bore the hole to fit the spinning center.

3. Insert the disk in the lathe and center it (see p. 21). Then draw up the follow block and lubricate the disk (see p. 19).

4. The spinning should be started by seating the disk.

5. If the metal shows any sign of buckling along the edge, place the backstick against the left side and force the metal to run between it and the flat tool. The backstick acts as a flexible chuck which yields to the pressure of the flat tool, but which, by forcing the metal to run between the tools, keeps it from wrinkling. Spin it tightly to the chuck with the exception of the last ¼ in. Trim it with a diamond-point tool.

6. Polish the bowl while it is still in the lathe.

7. From a piece of stock 2 by 3¾ by 3¾ in. turn the chuck for the cover of the bowl to shape and then sand it.

8. Spin the metal to the chuck.

9. Place the follow block, 1 in. in diameter, on the spinning center. With a diamond-point tool, cut a 2-in. circle from the cover. Remove it from the chuck and buff it on a buffing wheel.

10. The cigarette holder is made from a piece of pewter 11/16 by 1⅛ in. Hammer it to shape with a mallet over a stake.

11. Solder it in position on the cover.

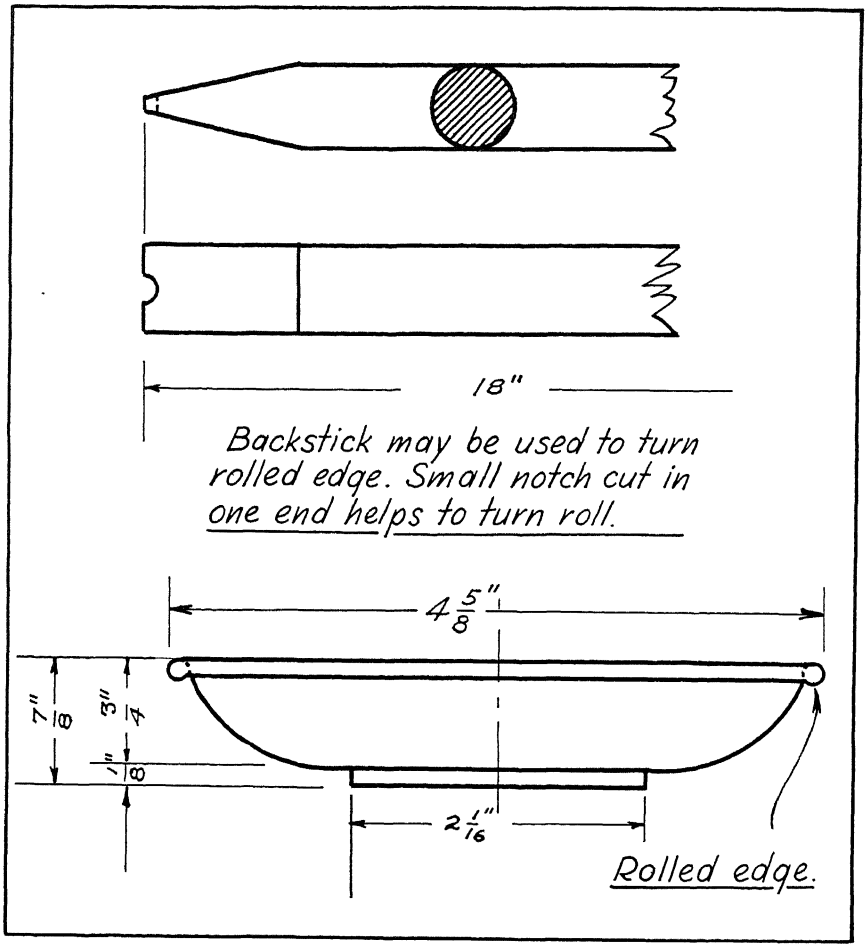
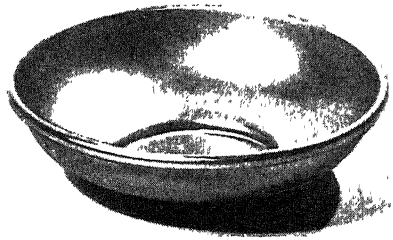


Fig. 44. Small Bowl



10. SMALL BOWL

This small bowl is a very easy project for the beginner, especially if it is made from 18-gauge pewter.

1. Cut a piece of 2-in. maple on the band saw to 4¾ in. in diameter.
2. Place it in the lathe, turn it to shape, and sand it smooth.
3. Then place the disk in the lathe. Draw up the follow block and center the disk.
4. Lubricate the disk and seat it to the chuck with a flat tool.
5. Spin it to the chuck with the exception of the last ⅜ in.
6. Trim the bowl to size with a diamond-point tool.
7. Make a backstick from an old broom handle and cut a circular notch in the tapered end (Fig. 44). The rolled edge can be made with surprising ease with this stick. The edge of the metal is placed in the notch and with a twist of the wrist toward the right the pewter edge will be converted into a roll. This method cannot be used on copper as the metal is too stiff.

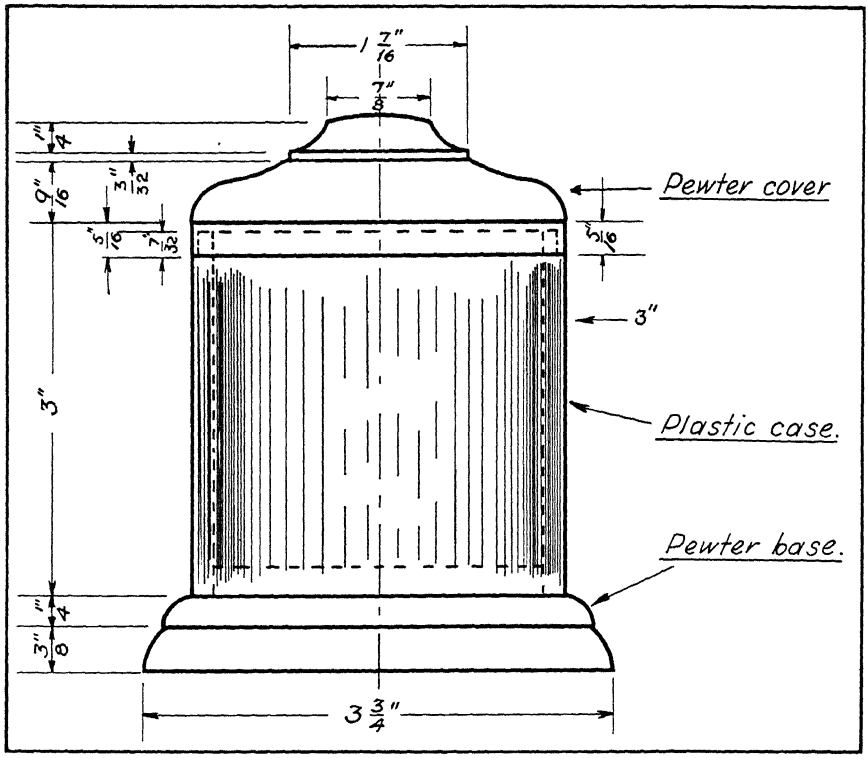
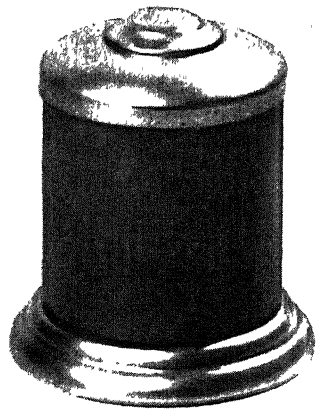


Fig. 46. Cigarette Case



11. CIGARETTE CASE

The combination of pewter and plastics makes a very beautiful cigarette container. The plastic can be obtained in cylinders and cut off to the length desired.

1. Cut the chuck for the base of the well from a piece of seasoned maple or birch, 1½ by 4 by 4 in.

2. The chuck may be fastened to the faceplate or if the lathe has a threaded spindle, a hole may be drilled in the chuck and tapped to fit.

3. Turn the follow block to 3 in. in diameter, and bore a hole for the spinning center.

4. Insert the disk and spin it to the chuck. Polish it while it is still in the lathe.

5. The cover chuck should be cut from a piece of material, 1½ by 3¼ by 3¼ in. Turn it to shape and sand it smooth.

6. Place the center of the disk against the bottom of the bowl chuck and draw up the follow block until it holds the disk in place. Start the lathe slowly and touch the disk with the soap mixture. Spin the disk to the chuck.

7. The case is made from a 3-in. plastic cylinder, 3 in. high. It may be polished in the lathe by turning a wooden form to fit the inside of the cylinder. This form should be slightly tapered to facilitate the easy removal of the plastic cylinder after it has been polished. The cylinder also may be polished on a buffing wheel. Avoid overheating the plastic because it is possible to soften it by friction and thus break down the surface and ruin the polishing job.

8. To assemble the base to the case make a disk of wood ¼ in. thick to fit tightly to the inside of the case. The disk may be cemented to the cylinder. Drill four small holes through the base, and fasten it to the disk with small wood screws.

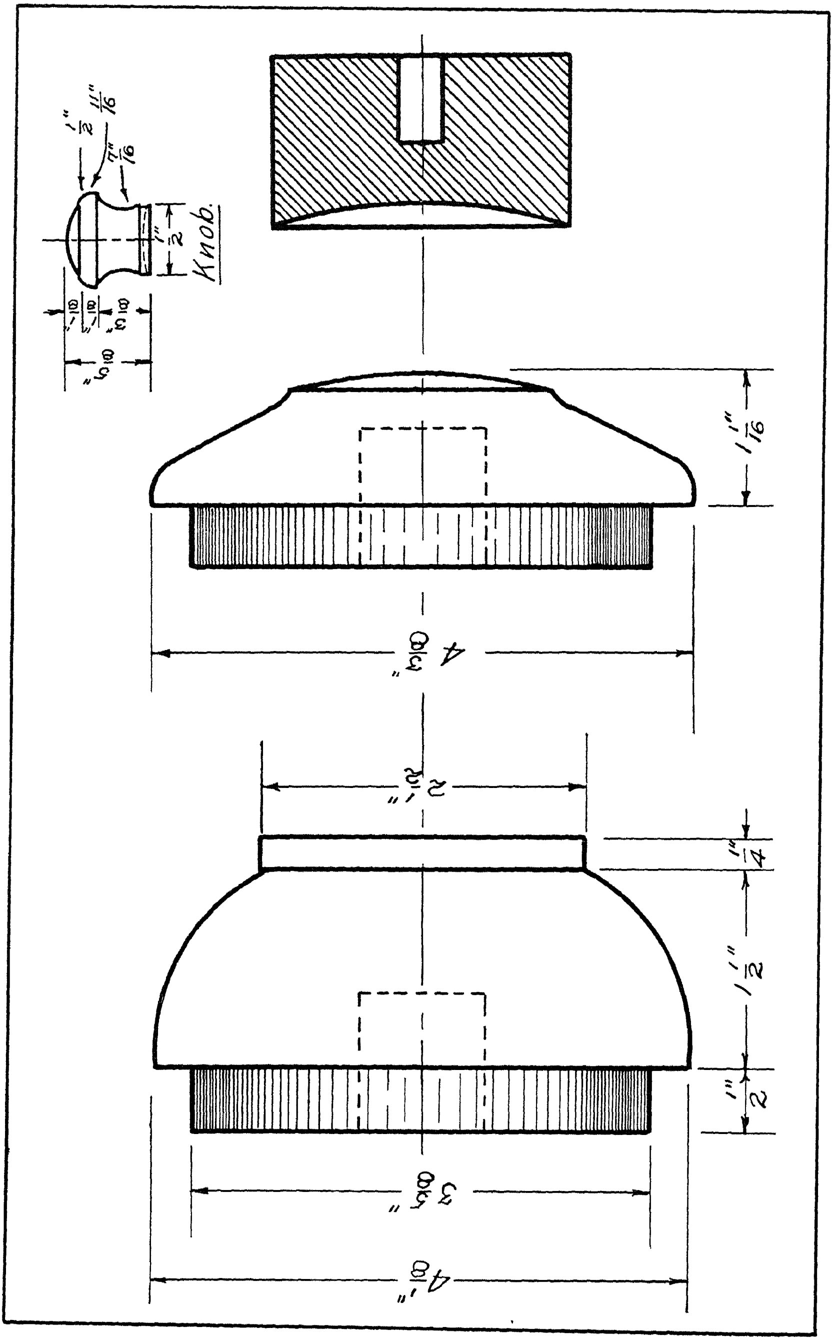


Fig. 18. Powder Box

12. POWDER BOX

1. Select a piece of well-seasoned maple or birch for the chuck, 3 by 4¼ by 4¼ in.
2. Scribe a circle on the block and cut it to size on the band saw.
3. Bore and tap a hole to fit the spindle.
4. Turn the chuck to size and sand it.
5. Turn the follow block to 2½ in. in diameter and bore a hole to fit the spinning center.
6. Use 18-gauge pewter for this project.
7. Place the disk in the lathe and spin it to the chuck.
8. Polish the bowl with steel wool before removing it from the lathe.
9. Make a chuck for the cover from a piece of wood, 2 by 4½ by 4½ in. Turn it to size and then sand it.
10. Repeat the operations for the cover. Test the spun cover with the base. If it is too large, trim the chuck and again spin the metal to the chuck.
11. The knob for this project is made by casting pewter into a hole bored into a block of wood (Fig. 50). After the knob has been turned to the dimensions given in Figure 48, use a 60–40 solder to attach it to the cover.

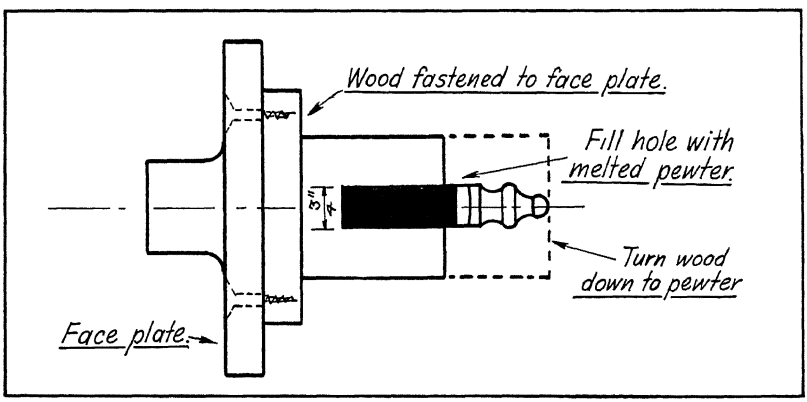


Fig. 50. Method for Turning Knobs

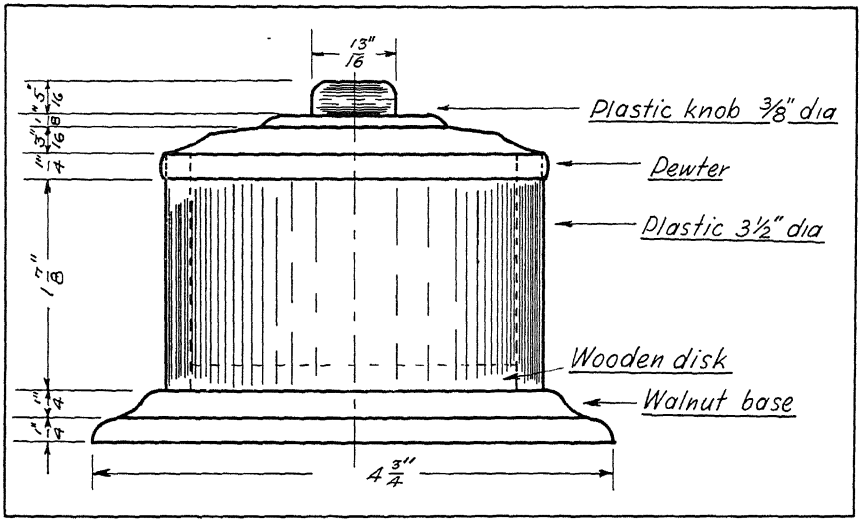


Fig. 51. Powder Box

13. POWDER BOX

The combination of plastic and pewter is used in making this powder box.

1. Two chucks are required for this project: one for the base made from a piece of wood, 1½ by 5 by 5 in.; the other for the cover made from a piece, 1½ by 3¾ by 3¾ in. Turn both pieces to size.

2. Spin the base to the chuck and polish it while it is still in the lathe.

3. Drill four small holes in the base to accommodate the small wood screws.

4. Place the chuck for the cover in the lathe and spin the disk to it. Polish the disk before removing it from the lathe.

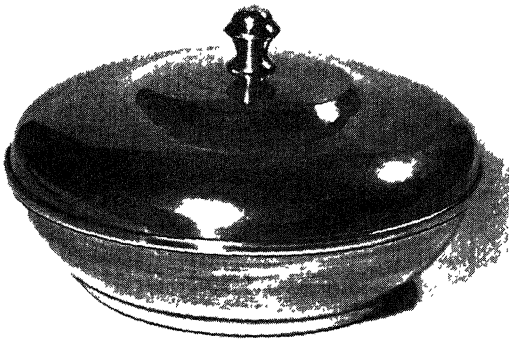
5. Drill a hole in the center of the cover for a small machine screw.

6. Cut a piece of ⅜ by 3/16-in. plastic rod. Smooth and round the ends with a fine file. The knob should be fastened to the cover with a small flat-head machine screw. A hole may be bored in the knob and the machine screw will cut its own threads.

7. The box that holds the powder is made from a 3½-in. plastic cylinder, 2⅛ in. high.

8. Turn a wooden disk 1¼ in. in diameter to fit the inside of the cylinder. Fasten it in place with plastic cement.

9. The base is fastened to the disk with small wood screws.



14. NUT BOWL

1. Select a piece of well-seasoned maple or birch for the chuck, 2 by 6 in.

2. If the lathe has a threaded spindle, drill a hole the proper size with a regular bit and tap it to fit the spindle threads. Screw a block to the spindle or fasten one to the faceplate. Turn it to the given dimensions and sand it smooth.

3. Then turn a follow block 3 in. in diameter and 1¼ in. thick.

4. Drill a hole in the center of the follow block to fit the spinning center.

5. Use 18-gauge pewter for this project.

6. Place the center of the disk against the bottom of the bowl chuck and draw up the follow block until it holds the disk in place. Do not place too much pressure on the disk. Start the lathe slowly and lubricate the disk with the soap mixture. The disk may be centered while the lathe is in motion. Place the center of the disk against the bottom of the bowl chuck, draw up the follow block until the disk begins to pull slightly, let go of the disk, and quickly tighten the follow block against it. If the disk is off center, release the follow block slightly, placing a piece of wood against the disk so that the pressure will cause the disk to center itself. When properly adjusted tighten the follow block and start spinning.

7. Set the fulcrum pin a little to the right of the disk. Place the spinning tool under the right arm, to the left, and against the pin. Exert pressure on the revolving disk at the bottom of the chuck so that the metal will be spun against the chuck on the first operation. This will seat the disk. Now ply the tool along the disk forcing the metal over the chuck. Do not use too much pressure. If the edge of the disk ripples, place a backstick against the disk opposite the spinning tool.

8. When the metal has been spun over the form, trim it to size.

9. Remove the tool rest. While the bowl is still in motion clean it with fine steel wool and buff it with rouge.

10. Repeat the above operations for the cover. Test the spun cover. If it is too large, trim the chuck and spin the metal to it.

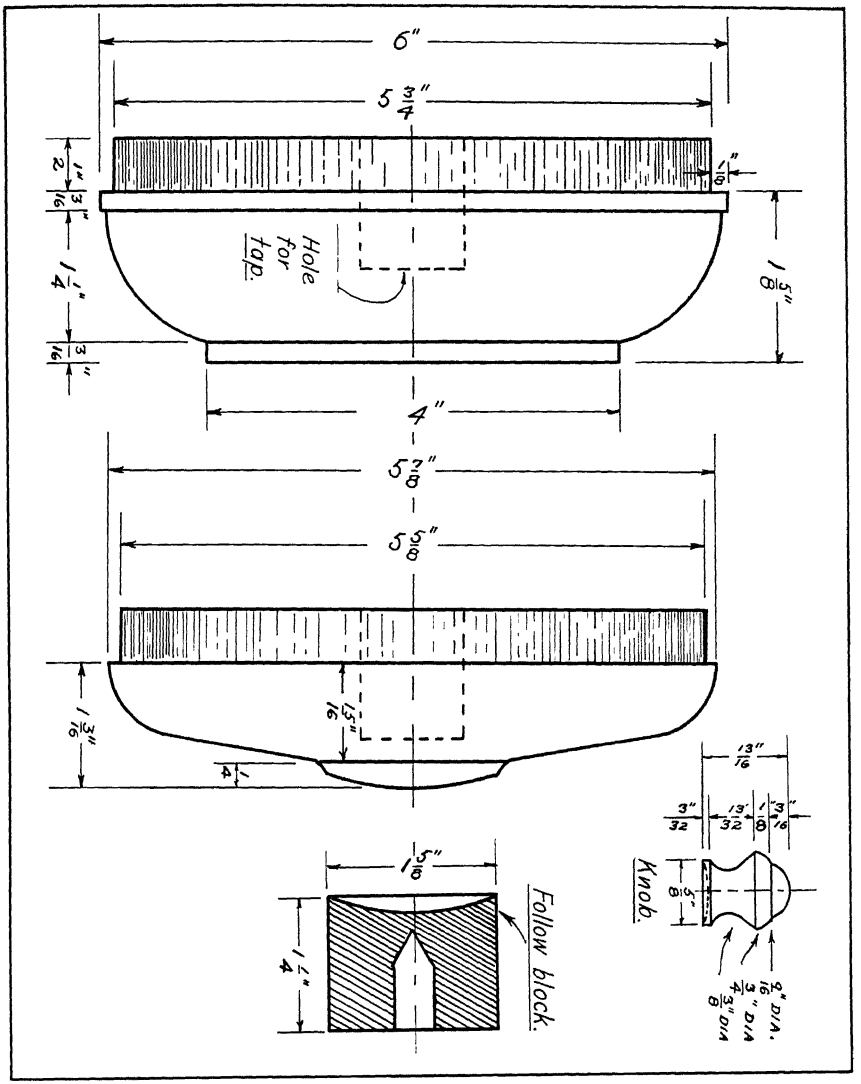


Fig. 53. Nut Bowl

11. The knob for this project is made by casting pewter into a hole bored into a block of wood. The dimensions and further directions for the knob are given in Figure 50. Use a 60–40 solder to attach the knob to the cover.

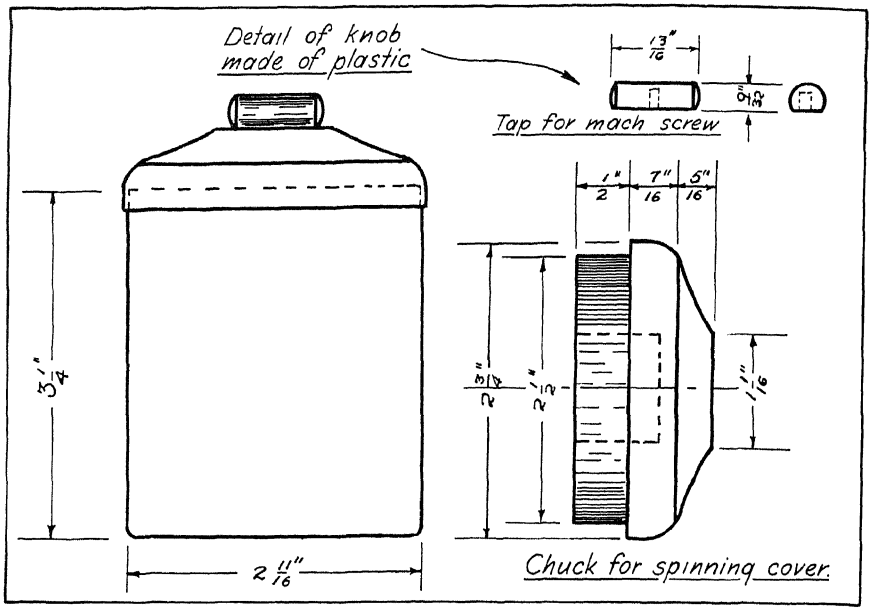
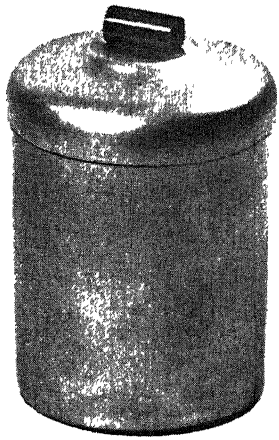


Fig. 55. Sugar Bowl



15. SUGAR BOWL

This sugar bowl is a companion piece to the creamer described in the succeeding project. Combined with a tray these two pieces make a beautiful combination for any dining table.

1. Use 18-gauge pewter for this project.
2. Glue the material for the chucks and turn them to size.
3. The follow block for the bowl should be turned to 2 11/16 in. diameter.
4. Place the disk in the lathe and spin it to the chuck.
5. Make the cover chuck as shown in the drawing.
6. Drill a hole to fit the small machine screw in the center of the cover.
7. Cut a piece of 3/8-in. plastic rod, 13/16 in. long. With a file remove about 1/16 in. from one side of the rod, in order to allow the knob to lie flatly on the cover. Drill and tap it for the machine screw.
8. Fasten the knob to the cover.
9. Buff the bowl with tripoli and finish it with rouge.

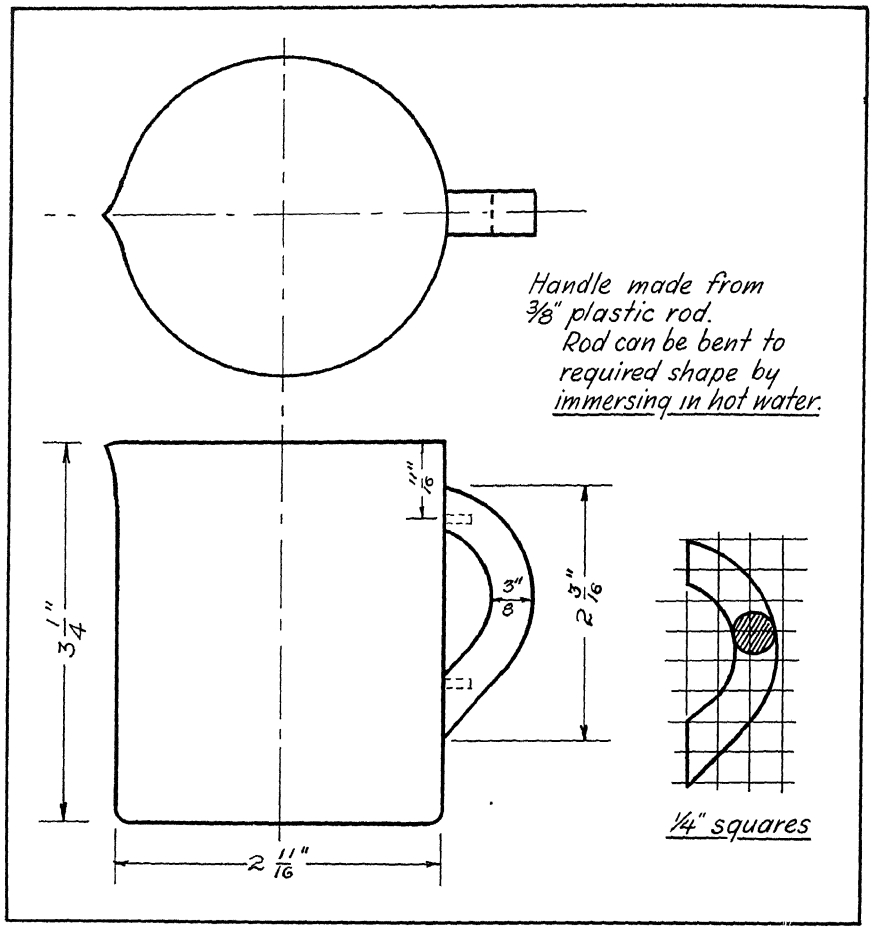


Fig. 57. Pewter Creamer

16. CREAMER

1. Glue up enough pieces to make a chuck 4 in. high and 3 in. in diameter. Then place it in the lathe and turn it to size.

2. Cut out a follow block to fit the diameter of the chuck. Bore a hole for the spinning center.

3. Center the pewter disk and start the spinning. The forming of the creamer is a little more difficult than some of the other projects. Pushing the metal to the chuck by moving from the base to the rim does not effect the metal at the rim immediately; the metal must increase its length from the base to the rim as it becomes thinner. Care has to be taken that the metal does not thin too rapidly. Use the backstick to prevent wrinkling and to serve as a secondary chuck.

4. Before the last ¼ in. of metal has been laid down to the chuck, trim it to size with the diamond-point tool.

5. Polish and buff the creamer while it is still in the lathe.

6. The spout for the creamer is formed by making a V cut in a block of wood and hammering the metal to shape with the round end of a forming mallet.

7. Cut a piece of ⅜-in. round plastic rod, 2 in. long. Immerse the rod in hot water for a few minutes and bend it to shape. Hold the plastic in place until it has cooled and then it will hold its shape permanently.

8. The handle may be fastened to the creamer with small machine screws.

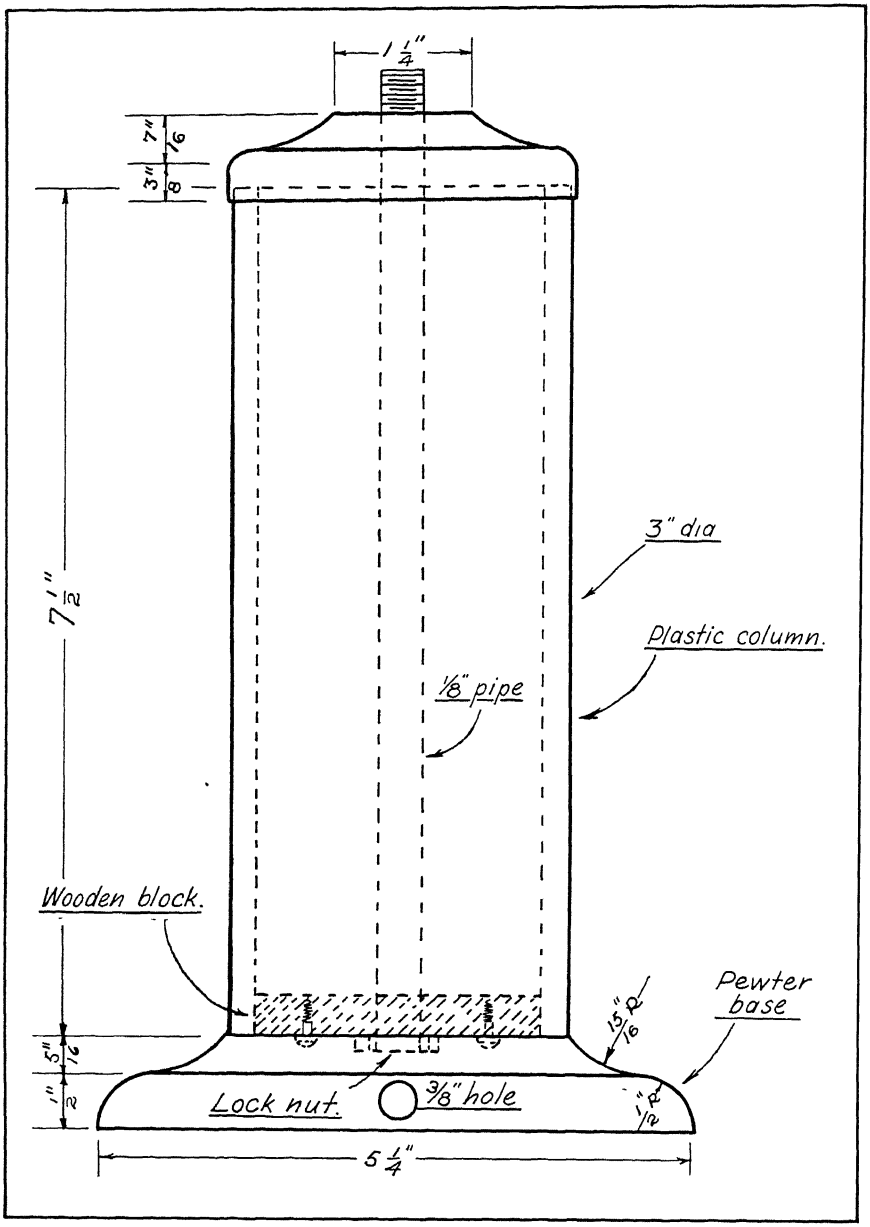
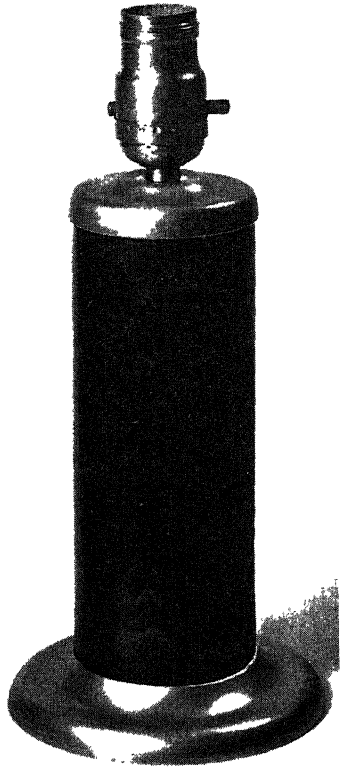


Fig. 59. Modernistic Lamp

17. MODERNISTIC LAMP



This modernistic lamp may be easily constructed by beginners in metal spinning. By using a light blue plastic for the column and pewter for the base and the top a beautiful lamp can be made.

1. The chuck may be constructed from a piece of 1½-in. stock. Scribe a 5½-in. circle and turn it down to 5¼ in. in diameter.

2. Seat the disk and complete the base by spinning it to the chuck. A roll edge may be spun on the base if desired.

3. Drill a ⅜-in. hole in the base for the cord as shown in Figure 59.

4. Construct the chuck for the top piece and spin it to shape.

5. Make the column from a piece of plastic 3 in. in diameter and 7½ in. long.

6. Turn a wooden circular disk to fit the inside of the column, ⅜ in. thick. Bore a hole in the center of this disk and also in the pewter base for a ¼-in. pipe. Thread the pipe at one end for a lock nut and at the other end for a socket.

7. Finally wire the lamp for use.

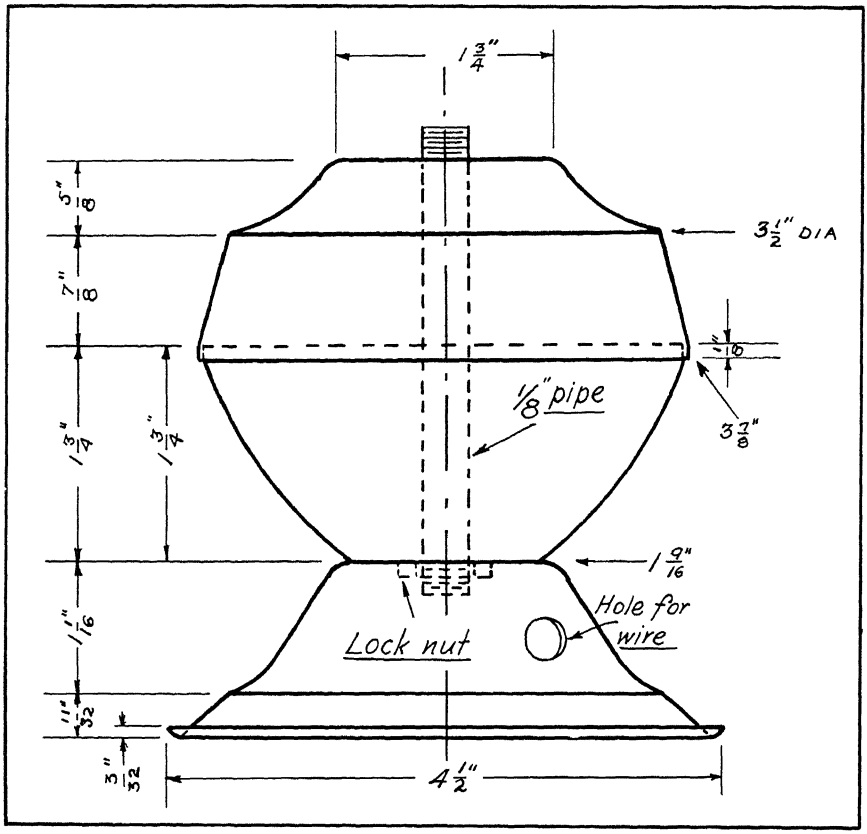


Fig. 61. Radio Lamp